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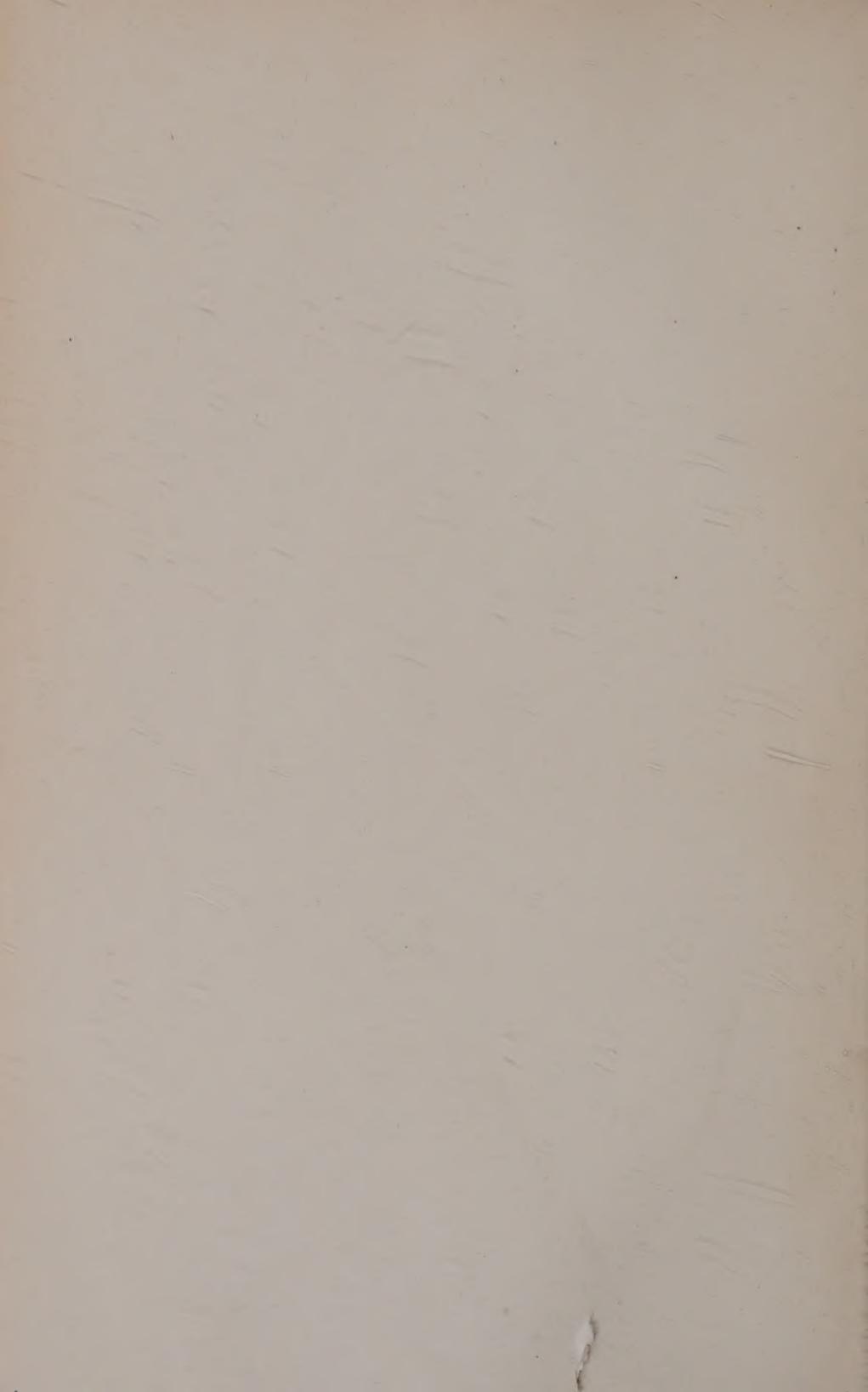
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HYGIENE
OF
THE NURSERY.

BY

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OF PENNSYLVANIA; PHYSICIAN TO THE CHILDREN'S HOSPITAL,
PHILADELPHIA, ETC., ETC.

WITH TWENTY-ONE ILLUSTRATIONS.

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TO

MY LITTLE PATIENTS,

SOME OF WHOM,

IN THE RAPID PASSING OF TIME, MAY SOON ASSUME

PARENTAL DUTIES,

THIS VOLUME

IS AFFECTIONATELY DEDICATED.

PREFACE.

Having a firm belief in the proverb that "an ounce of prevention is worth a pound of cure," the author has endeavored, in the succeeding pages, to point out a series of hygienic rules which, if applied to the nursling, can hardly fail to maintain good health, give vigor to the frame and so lessen susceptibility to disease.

He feels, too, that intelligent parents are ever ready to be instructed and willing to coöperate in the great work of preventing disease—the highest aim of scientific medicine.

While every woman of ordinary brain-power can do much to keep her baby well, she should recognize that years of training and experience are necessary to acquire the ability to put the full value upon symptoms, and to handle the tools of medicine. Therefore, little or no reference has been made to drugs or methods of medical treatment.

The first chapter is written with the object of hinting to the mother when, by deviations from the features of health, she may expect the onset of disease and call in professional counsel. The last is offered, not as a complete guide to the

practice of physic, but simply for the sake of giving information upon questions that often arise in the nursery.

The child's doctor, in our day, regulates his patient's diet, clothing, bathing and exercise, and looks into the hygiene of the nursery before he orders medicines, and if the mother has sound ideas upon these subjects she is no mean assistant.

The author's thanks are due to Dr. W. M. POWELL for efficient aid in the preparation of the manuscript and index, and to Dr. ALLEN J. SMITH for the illustrations.

LOUIS STARR.

1922 SPRUCE STREET, PHILADELPHIA.

September, 1888.

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HYGIENE OF THE NURSERY.

CHAPTER I.

THE FEATURES OF HEALTH.

Every ill child presents certain well-defined alterations in the manner of performance of the various functions of his body. Thus, the pulse and respiration may be altered in character and frequency; the surface temperature may be elevated; the color and condition of the skin may be changed; the appetite may be diminished; weight may be lost, and so on. These alterations from the normal state are termed *symptoms*.

Healthy children, on the other hand, as uniformly show evidences of their well-being, which, for want of a better name, may be called the *features of health*. Of these, every mother should have a full knowledge, so that by appreciating variations she may anticipate the complete development of disease, and early summon skilled aid, at the time when it is of most service.

Early life must be divided into two periods, namely, infancy and childhood. Infancy is the time elapsing between birth and the complete eruption of the milk teeth, an event that transpires about the end of the second year of life. Childhood extends from this age to the development of puberty, or to the age of thirteen or fifteen years. It is important to remember these two divisions, as frequent reference will be made to them in the subsequent pages.

With this brief preparation, the study of the features of health may be entered upon.

1. The Face.—The face of a healthy, sleeping child wears an expression of absolute repose. The eyelids are completely closed, the lips very slightly parted, and, though a faint sound of rhythmical breathing may be heard, there is no visible movement of the nostrils. When awake and undisturbed, the healthy infant's face has a look of wondering observation of whatever is going on about it. As age advances intelligence gradually supplants the wondering gaze, and no one can be unfamiliar with the bright, round, happy face of perfect childhood, so indicative of careless contentment, and so mobile in response to emotions.

Examples of Variations in Disease.—Incomplete closure of the eyelids, rendering the whites of the eyes visible during sleep, is a symptom in all acute and chronic diseases of a severe type, it is also to be observed when rest is rendered unsound by pain, wherever seated. Twitching of the eyelids, oscillation of the eyeballs and squinting, herald the visit of convulsions. Widening of the orifices of the nose with movements of the nostrils to and fro, point to embarrassed breathing from disease of the lungs or their pleural investment. Contraction of the brows indicates pain in the head; sharpness of the nostrils, pain in the chest, and a drawn upper lip, pain in the abdomen. To make a general rule, it may be stated, that the upper third of the face is altered in expression in affections of the brain; the middle third in diseases of the chest, and the lower third in diseases of the organs contained in the abdominal cavity.

2. The Skin and General Appearance.—In the new-born infant the color of the skin varies from a deep to a light shade of red. After the first week this redness fades away, leaving the surface yellowish white. At times this yellow color is so marked that it might be mistaken for jaundice were it not that the whites of the eyes remain per-

fectly pearly, which is never the case in the disease mentioned. After the second week all discoloration disappears and the skin assumes its typical appearance.

With certain well-known natural variations in complexion the skin of a healthy child is beautifully white and transparent. The cheeks, palms of the hands and soles of the feet have a delicate pink color, while the general surface is rosy in a warm atmosphere and marbled with faint blue spots or lines in a cold one. As age advances the coloring becomes more pronounced, and until the completion of childhood the complexion is much fresher than in adult life.

Other characters of the healthy skin are, a velvety smoothness and softness, a scarcely perceptible moisture, and a great degree of elasticity.

If an infant be stripped the large size of the head and trunk, and the relatively short arms and even shorter legs, will strike the observer at once. This disproportion, especially noticeable in the head, is an actual one. For if in a child of one year, for example, the distance from the lower edge of the chin to the top of the head be measured, it will be found to be equal to one-fourth of the entire length of the body. The vertical length of the head, too, falls but little short of that of the trunk, and the latter in turn is nearly as long as the legs.

Again, the abdomen is full and prominent, making the chest look, in comparison, rather contracted and narrow, and the navel is less deeply sunken than in adults.

These features, which will be referred to more minutely in a later section, are most marked in young infants, and undergo gradual alterations as growth progresses and the child develops into the lithe, active youth or maiden.

The shape of the head varies greatly between the round, bullet form and the elongated oval one. When it has been

subjected to much pressure, instrumental or otherwise, during delivery, it is often so distorted as to shock the expectant mother. Little fear of permanent disfigurement need be entertained, however, as the deformed head usually assumes a natural shape in time. The same is true of less noticeable depressions, prominences and irregularities. But it should be remembered that restoration to symmetry must be left entirely to nature, as any attempt to mould the skull by pressure rarely fails to injure the delicate brain beneath.

The anterior fontanelle, or, as it is called by nurses, "the opening of the head," is readily seen and felt in infants under a year old. In the normal state it is level with, or very slightly depressed below, the surrounding bones of the skull, and may be observed to pulsate, or rise and fall, rhythmically. To the fingers it feels soft and yields readily to pressure.

Examples of Variations in Disease.—Lividity of the eyelids and lips is a sign of imperfect oxidization of the blood, and points to disease of the heart or lungs. A decided yellow color of the skin and whites of the eyes is seen in jaundice; an earthy tinge of the face, in long-standing disease of the bowels; a waxy pallor in kidney disease, and paleness in any acute or chronic affection attended by exhaustion.

Marked squareness of the head with projection of the forehead, a widely-open fontanelle, and a relatively small face indicates rickets. A large, globular head is characteristic of hydrocephalus or "water on the brain." Bulging of the fontanelle is also a symptom of hydrocephalus, while depression shows general debility and the need of food or stimulants.

Great distention of the abdomen is usually due to an

accumulation of gas in the intestines, and indicates disease of this portion of the digestive tract; marked depression, on the other hand, is encountered in serious brain affections, in cholera infantum, inflammation of the intestines and dysentery.

3. Development.—To be robust the newly-born infant must have a certain average length and weight. The length varies between sixteen and twenty-two inches, and the weight between six and eight pounds.

From the first day growth, or increase in length and weight, steadily progresses, according to certain definitely fixed rules.

Length increases most rapidly during the first week of life; afterward the progress is almost uniform up to the fifth month, and then it becomes less rapid, though still uniform, until the end of the twelfth month.

These facts may be seen in the following table:—

AGE.	LENGTH.
Birth.	19.5 inches.
1 month	20.5 "
2 "	21. "
3 "	22. "
4 "	23. "
5 "	23.5 "
6 "	24. "
7 "	24.5 "
8 "	25. "
9 "	25.5 "
10 "	26. "
11 "	26.5 "
12 "	27. "

During the second year the increase is from three to five inches; in the third from two to three and a half inches; in the fourth from two to three inches, and from this age up to the sixteenth year the average annual gain is from one and two-thirds to two inches.

In the first three days of life there is always a loss of weight, but by the seventh day the babe should have regained weight and be as heavy as at birth. The period of most rapid gain in this respect is during the first five months of life. The maximum is attained during the second month, when the increase is from four to seven ounces each week. Throughout the next three months the increase amounts to about five ounces per week, and in the remaining months of the first year from two to five ounces.

The subjoined table shows the average rate of gain:—

AGE.	WEIGHT.
Birth.	7 pounds.
1 month	7 $\frac{3}{4}$ "
2 "	9 $\frac{1}{2}$ "
3 "	11 "
4 "	12 $\frac{1}{2}$ "
5 "	14 "
6 "	15 "
7 "	16 "
8 "	17 "
9 "	18 "
10 "	19 "
11 "	20 "
12 "	21 "

From the first to the tenth year there should be a yearly gain of at least four or five pounds, and after, to the sixteenth year, of about eight pounds in the same period.

Parents frequently over-estimate the weight of their children by placing them upon the scales when completely dressed. To be accurate, the weight of the clothing must be subtracted. This may be estimated at about three pounds for a child of three to five years, four pounds for one of eight years, and eight pounds at fifteen years.

Another reliable evidence of the proper progress of development is the increase in the girth of the chest. Taking an infant weighing seven pounds and measuring nineteen and a half inches at birth, this should be a little over thirteen inches. By the fourth month it should be increased to fifteen inches; by the sixth, to sixteen; by the twelfth to about seventeen; by the fifth year to twenty-one, and by the sixteenth year to thirty.

As already mentioned, the proportions of the different members of the frame in infancy differ materially from those of adolescence.

Primarily the head and secondarily the body are large when compared with the arms and legs, but in the progress of healthy development this disproportion is gradually lessened until the perfect human figure is attained. This developmental process, however, does not affect all parts of the body equally, as may be seen in the accompanying diagram.* (p. 24.)

The description is so well put in the journal from which this figure is taken that I cannot do better than quote it word for word.

“ The six figures represent the average relative stature of

* “ Babyhood,” Vol. II, page 311.

males of the ages of one, five, nine, thirteen, seventeen, and twenty-two years. It will be noticed that the figures all stand on a level plain. The tops of the heads are connected by a dotted line, and the height of each figure is divided into four equal parts, the points of division being connected with the corresponding ones in each figure. If the rate of growth were uniform the dotted lines connecting the heads would, of course, be straight if a child for every year were included in the rank. But in the earlier years the growth

FIG. 1.

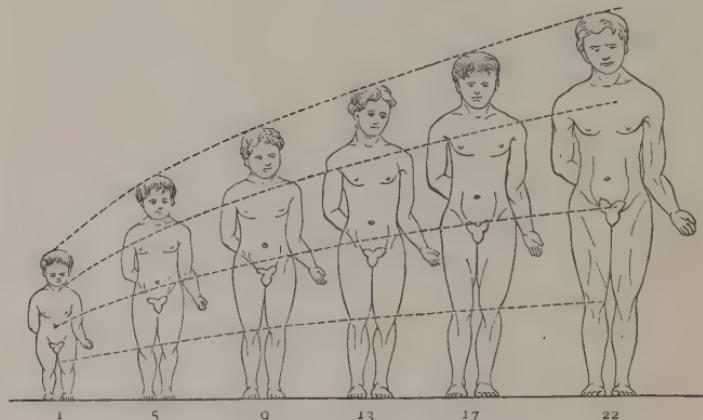


DIAGRAM SHOWING RELATIVE STATURE FROM 1 TO 22 YEARS OF AGE.

is much more rapid than it is later, and hence the line is a curve rising quite suddenly at the first, and becoming flatter toward the end of growth. It is to be understood that these are all *averages*—including, but not showing, the extremes of slowness and rapidity of growth as well as fitfulness of growth. The diagram also shows the different development of different parts of the person. The head, for instance, in the child of one year is nearly one-fourth of the

whole height ; that of the adult is about two-thirteenths, or, to use the phrase of artists, the little child is not much more than four heads high, while the adult of twenty-two is about six^o and one-half heads high ; and even this is a much larger head than the average adult has. Notice that the third dotted line, marking one-half of the total height, crosses the navel in the infant, while in the adult the half height mark is but little above the juncture of the legs and the body, which shows how much larger, proportionately, the body of an infant is than an adult's. If this same line be followed it will be noticed that it keeps well up in the abdomen until after the age of nine. Between that age and puberty the growth of the lower extremities is usually very rapid, and the well-known "shooting up" of boys and girls takes place, the whole person growing, but the lower part in particular. Similar changes of location will be noticed by following the quarter-lines, but the changes are not so abrupt."

It may be well to mention here that children will often remain, for a considerable time, almost stationary in height, and then have periods of very rapid growth. The latter is often to be observed in the ninth or tenth year, and again at the approach of puberty. Variations in weight-gain are also often to be observed ; these seem to hold a definite relation to the fluctuations in the rapidity of height-increase.

Besides these points, which are the most reliable evidences of the proper progress of development, there are certain features that appeal more directly to the notice of parents, and, on this account deserve consideration. The age at which a child sits erect, at which it creeps, walks or talks, are instances of the class of features referred to.

The head can usually be held erect by the end of the third month and the body maintained in the sitting posture

a month later. By the sixth month the infant can sit up with ease, accomplish many movements with the arms, hands and fingers, and enjoy playthings. At the eighth month he may be able to creep; by the ninth or tenth to drag himself upon his feet with the assistance of his hands and arms and some artificial support; by the eleventh to walk with assistance; by the fourteenth to walk alone, and by the eighteenth to run.

At eight months an infant will imitate sounds and articulate several syllables; at ten can often speak one or two words, and after twelve months is able to join several words together.

The anterior fontanelle should be completely closed at some period between the fifteenth and twentieth months.

Tears begin to be secreted during the third or fourth month, and saliva between the fifth and sixth.

After birth both hair and eyes often change color as age advances. When an alteration takes place in the eyes, it begins about the sixth or eighth week and may be to either a lighter or darker hue. Changes in the hair begin later, the tendency always being to darken, and the most marked alteration occurring between the seventh and fourteenth years.

Examples of Variations in Disease.—If on being measured and weighed, a child be found to fall short of the normal standard for its age, and if, at the same time, there is a want of plumpness of body, roundness of limb, and firmness of flesh, the existence of some fault in diet or in the digestion and absorption of food must be inferred.

A delay in walking may be due to general feebleness or to paralysis of the muscles of one or both legs, and a limping gait with pain in the knee suggests hip-joint disease.

Closure of the fontanelle is retarded by the disease

called rickets, and also by hydrocephalus and constitutional syphilis.

It is well to be cognizant of the fact that girls develop more rapidly than boys, and that the second and later children of the same family, by imitating their elders in the nursery, learn to talk and walk earlier than those who happen to be born first.

4. Position and Gestures.—The complete repose depicted on the countenance of a sleeping child when free from illness is shown also by the posture of the body. The head lies easy on the pillow, the trunk rests on the side, slightly inclined backward, the limbs assume various but always most graceful attitudes, and no movement is observable but the gentle rise and fall of the abdomen in respiration. In the waking state, the child, after early infancy, is rarely still. The movements of the arms, at first awkward, soon become full of purpose as he reaches to handle and examine various objects about him. The legs are idle longer, though these, too, soon begin to move about with method, feeling the ground, in preparation, as it were, for creeping and walking.

Examples of Variations in Disease.—Restless sleep with a desire to be rocked, fondled or “walked” in the nurse’s arms, are common symptoms of acute attacks of illness, especially when attended by pain. Children beyond the age of infancy toss about uneasily in bed or demand a change from the bed to the lap, under similar circumstances. Extreme and long-continued drowsiness and quietness, on the other hand, often precede the visit of such specific fevers as scarlatina or measles.

Sleeping with the head thrown back and the mouth open indicates enlarged tonsils; a tendency to “sleep high,” or with the head and shoulders elevated by the pillow accom-

panies disease of the heart and lungs, and "sleeping cool," that is, resting only after the bed clothing has been kicked off, is an early symptom of rickets.

Frequent carrying of the hand to the head, ear or mouth shows headache, earache, or the pain of a coming tooth, as the case may be, while constant rubbing of the nose is a feature of irritation of the bowels or stomach.

Should the thumbs be drawn into the palms of the hands, and the fingers tightly clasped over them, or if the toes be strongly flexed or extended, a convulsion may be expected.

5. The Voice.—Crying is the chief if not the only way that the young infant possesses of making known his displeasure, discomfort or suffering, and affords almost the sole means of determining the characters of the voice at this early age. Again, even long after the powers of speech have been developed, the cry continues to be the main channel of complaint.

One rarely hears a healthy child cry, unless a harsh word, a fall or a blow cause a passing storm of grief, anger or pain. Hence, frequent, peevish crying points to some disturbance of the healthy balance.

The sound of the voice, whether in crying or speaking, should have a clear ring, without either muffling, hoarseness or nasal tone. Weeping should accompany crying, after the establishment of tear secretion. Cough, although not a normal vocal sound, is also worthy of attention.

Examples of Variations in Disease.—Incessant, unappeasable crying is usually due to earache or hunger; it frequently, too, is caused by the constant pricking of a badly-adjusted safety-pin or other mechanical irritant.

If crying occur during an attack of coughing it is an indication of some painful affection of the chest; if just before or after an evacuation of the bowels, of intestinal pain.

When the cry has a nasal tone it should suggest swelling of the lining membrane of the nose, or other obstructing condition. Thickening and indistinctness occurs with throat affections. A loud, brazen cry is a precursor of spasmodic croup, and a faint, whispering cry of true or membranous croup. Hoarseness points to disease of the lining membrane of the larynx, either catarrhal or syphilitic in nature.

Finally, a manifest unwillingness to cry can be seen in pneumonia and pleurisy, when the disease is severe enough to interfere materially with breathing.

Tear-secretion having been established it is a bad omen if the secretion be arrested during the progress of an illness, but an equally good one if there be no suppression, or if there be a reëstablishment after suppression.

The cough, like the voice, may be brazen in spasmodic croup, hoarse in laryngeal catarrh, and suppressed in true croup. The qualities "tightness" and "looseness" are readily appreciated and give a good idea of the progress of lung affections, especially bronchitis, the former being an evidence of the beginning, the latter of the favorable termination of an attack.

Cough is always unproductive, that is, unattended by expectoration, in children under seven years of age.

6. Mode of Drinking and Swallowing.—By watching an infant taking the breast or bottle, some information can be obtained of the condition of the mouth and throat, and of the respiratory organs.

A healthy child drinks continuously without stopping to breathe, and swallows easily.

Examples of Variations in Disease.—If there be any soreness of the mouth the nipple will be held only for a moment and then dropped with a cry of pain. When the throat is affected in infants, swallowing is performed with a gulp and

an expression of pain passes over the face, and no more efforts are made than required to satisfy the first cravings of hunger. Older children, under similar circumstances, drink little and refuse solid food.

An infant suffering from the oppressed breathing of pneumonia or severe bronchitis, seizes the nipple with avidity, swallows quickly several times and then pauses for breath. In older children the act of drinking, which should be continuous, is interrupted in the same way.

If the finger be put into the mouth of a healthy baby it will be vigorously sucked for some little time. Diminution of this act of suction during a severe illness is a sign of danger; its reestablishment a good omen. In conditions of stupor it is noticeably absent.

7. Appetite.—Hunger and appetite must not be regarded as synonymous terms. The former is the craving of all the tissues of the body for nutritive material, or food, and is expressed by a sinking or craving sensation in the stomach. The latter, on the other hand, though it is certainly an attendant of hunger, is simply a sensation of the desire for something with a food-taste, having its seat in the mouth and surrounding parts. Appetite having its post, as it were, at the entrance of the stomach, may be regarded as a gate-keeper to supervise everything presented for entrance and to reject all that may be injurious either to the stomach or the general economy.

Like its analogue the gate-keeper, the trustworthiness of the appetite may be destroyed by over-indulgence and bad habits. Under the last head come the constant administration of too much or too little food, the use of over-rich food and irregularity in meal hours.

A healthy appetite—that is one that leads a child to consume with enjoyment the food set before him—may be

encouraged by muscular and mental exercise; by contentment; by regular habits as to the hours of eating; by the use of plain food only, and by varying the food, in a greater or less degree, according to the age. If the quantity of food consumed at the regular meals does not come up to the parent's standard of sufficiency, nothing can be worse than too dainty feeding and an encouragement to eat between meals.

There can be no question that a good appetite is a useful as well as a pleasant faculty for a child to possess, for there is no doubt that food eaten with relish is much better digested and therefore more serviceable in nutrition than that which is simply crowded into the stomach.

Examples of Variations in Disease.—Loss of appetite is encountered in febrile attacks and in acute disorders of the stomach. Inordinate appetite, on the contrary, is usually met with when too *strong* food has been administered. Here the increased hunger is due to the fact that the food administered, while it may be very rich in nutritive properties, is ill-adapted to the delicate digestive power of early life, and thus, by not being properly prepared for absorption, places the child in the anomalous position of starving in the midst of plenty. In more advanced children gluttony may depend upon gastric irritation, a condition which often leads older and presumably wiser heads to over-indulgence at table.

8. Eruption.—Eruption or regurgitation is readily produced and of frequent occurrence in infancy, on account of the vertical position and cylindrical outline of the stomach at this period of life.

Babies suckled at a freely-secreting breast, often eructate, though they may be in the best possible health. In these cases, the supply of food being large, the infant, as it lies at the breast, is apt to draw more than it needs and more than

it can digest, and the stomach, through a wise provision of nature, rids itself of the superabundance by the simple act of regurgitation. In this process, which in reality is an evidence of health, there is no violent muscular effort, as in retching or vomiting, nor any evidence of nausea, and the material ejected is the breast milk alone, either entirely unaltered or slightly curdled.

In older children, expulsion of the contents of the stomach, or vomiting, may also occur after the stomach has been overladen. If the act be followed by relief from a feeling of general distress, headache and pain in the upper abdomen, it is not to be regarded as a symptom of disease.

Examples of Variations in Disease.—Vomiting, with its violent muscular effort and the attendance of the train of symptoms embraced under the term nausea—namely, pallor, languor, faintness and an increased secretion of saliva—occurs in many different conditions. It may indicate disease of the stomach, of the intestines, of the lungs or their pleural investment, and of the brain, or it may be an initial symptom of one of the eruptive fevers, scarlet fever or measles, for example, which condition, when existent, can only be determined by closely observing the special case.

The character of the material ejected from the stomach is more definite. Thus, the expulsion of mucus is a symptom of gastric catarrh. The regurgitation of mouthfuls of curdled milk, partly digested food and liquid, so sour that it causes a grimace to pass over the face, is an indication of dyspepsia with fermentation and the formation of an irritant acid. The appearance of lumbricoid worms in the vomit, a not very infrequent occurrence, shows, without dispute, the existence of these parasites in the digestive canal.

9. The Fæcal Evacuations.—The daily number of evacuations of the bowels natural for a child varies greatly

with its age. For the first six weeks there should be three or four movements every twenty-four hours. After this time up to the end of the second year, two movements a day is the normal average. Subsequently, the frequency is the same as in adults—once per diem—though two or three movements in the same interval may occur, especially after over-feeding or after eating food difficult of digestion, and must be looked upon as conservative rather than as the evidence of ill-health.

During the first period the passages have the consistence of thick soup, are yellowish-white or orange-yellow in color, with sometimes a tinge of green, have a faint faecal, slightly sour odor, and are acid in reaction. In the second, they are mushy or imperfectly *formed*, of uniform consistence throughout, brownish-yellow in color, and have a more faecal odor. The last two characters become more marked as additions are made to the diet. After the completion of the first dentition the motions have the same appearance as in adult life, they are *formed*, are brownish in color, and have a decided faecal odor.

Examples of Variations in Disease.—Many alterations occur in disease. The frequency of the movements may be increased, constituting diarrhoea, or lessened, constituting constipation. In the former condition the consistency is diminished, in the latter increased. Instead of being uniform throughout, the movement may be mixed, partly liquid, partly solid, indicating imperfect digestion, and curds of milk or pieces of undigested solid food may be mingled with the mass. Flaky, yellowish or yellowish-green evacuations, containing whitish, cheesy lumps, are also met with in cases of indigestion. Scanty, lumpy evacuations, dark brown or black in color, and mixed with mucus, are characteristic of intestinal catarrh. Doughy, grayish, or clay-

colored motions show an inactive liver. An intermixture of blood, altered blood clots, and shreds of mucous membrane, indicate ulceration of the intestinal lining, such as occurs in intestinal inflammation, typhoid fever, dysentery and tubercular disease. Watery, almost odorless passages occur in the latter stages of summer complaint; most offensive, carrion-like motions, in both catarrhal and tuberculous ulceration of the intestines, and sour-smelling evacuations in the diarrhoea of sucklings. The discovery of worms in the movements is the only certain evidence of the existence of intestinal parasites.

This mere outline of the changes that may take place will serve to show how much may be learned from the evacuations, and the importance of preserving them for the physician's inspection.

10. The Urine.—It is impossible to make a definite statement as to the number of times the urine is voided by a healthy infant in each twenty-four hours. In any given case the frequency will differ very much from day to day, depending upon the temperature of the surrounding air and the amount of moisture that it contains. Sometimes it will be necessary to change the napkin every hour during the day and three or four times at night. Again, it may remain dry for six, eight, or even ten hours. Neither condition indicates disease. If, however, the urine is not passed for twelve hours, a careful examination should be made.

Between these two extremes there is a wide range of variation.

As the child grows older the frequency diminishes, and at the age of three years the number of voidings will be reduced to six or eight during the waking hours, and perhaps one at night. When the desire does arise during sleep, the child, if in a normal state, wakes up and demands the

chamber, and never passes urine unconsciously. Wetting the bed, therefore, or the involuntary passage of the urine during sleep, is indicative of an abnormal condition and requires investigation. From a few observations, I am led to believe that the quantity of urine voided by healthy children from the fourth to the seventh years is not nearly so large as supposed; eighteen to twenty ounces being the average in several cases in which I have lately made measurements.

The urine of an infant, while it wets, should not *stain* the napkin.

Examples of Variations in Disease.—In certain cases of bad digestion the urine becomes very concentrated and high-colored, and gives a light yellow tinge to the napkin. When the stain is decidedly yellow, jaundice is indicated, and other symptoms of this condition should be looked for.

In older children a high-colored urine, and one which deposits a whitish or purplish sediment on standing, is symptomatic of acute digestive disorder, either catarrhal in its nature, or secondary to some acute febrile affection. A smoky, blackish hue, looking as if there had been an admixture of soot, is characteristic of acute scarlatinal nephritis; in this state, too, there is a great diminution in the amount passed.

Painful urination points to inflammation of the urethra, a narrow orifice, a highly acid condition of the excretion, or stone in the bladder.

11. The Respiration.—In adults there are two well-marked types of respiration, viz., the *abdominal* and the *superior costal*. The abdominal—met with in perfection in adult males—is the type in which the movements of inspiration and expiration are performed by the muscles of the abdomen and lower third of the chest. In superior costal

respiration, on the other hand, the movements are most marked in the upper third of the chest; this form is best developed in healthy adult females.

In children the respiration is chiefly *abdominal* in type, irrespective of sex, and it is not until just before the age of puberty that the movements in the female change, becoming *superior costal*. Consequently, in estimating the number of movements per minute it is best to place the fingers lightly on the upper abdomen. The count should always be made by the watch, the most convenient time for the observation being while the child sleeps.

Soon after birth the number of movements per minute is 44, between the ages of two months and two years 35, and between two and twelve years, 23. During sleep the frequency is reduced about twenty per cent.

Children under two years, while awake, breathe unevenly and irregularly; there are frequent pauses followed by hurry and precipitation, and some of the movements are shallow, others deep. In sleep there is greater regularity. After the second year the movements become steady and even, like those of adults. All children, however, but particularly the very young, are subject to a great increase in the rapidity of respiration under the excitement of muscular movement and mental emotion.

Perfectly healthy children breathe through the nose, and so softly that it is necessary to place the ear close to the face to hear the breezy sound of the ingoing and outgoing air.

Examples of Variations in Disease.—Accelerated breathing occurs during the course of diseases attended by severe fever. Acute affections of the lungs are especially characterized by this alteration, and the more the breathing area is lessened the greater is the increase. Thus, in pneumonia,

60, 80 or 100 movements a minute are not at all unusual. To speak broadly, rapid breathing may be caused by an elevation in the body temperature, by an interference with the blood aeration and by thoracic or abdominal pain.

Diminished frequency—the movements being reduced to 16, 12, or even 8 in the minute—is encountered in certain brain affections ; namely, in chronic hydrocephalus, and the later stages of tubercular meningitis. In such cases the rhythm may be greatly altered—a *tidal* form being assumed, in which the breathing ebbs and flows, beginning with an act which is scarcely perceptible or audible, gradually growing deeper until a full, noisy respiration is made, and then slowly subsiding into a period of absolute quiet, variable in its duration. This is termed Cheyne-Stokes' respiration.

A dry, hissing sound, or a moist sound of snuffling indicates partial obstruction of the nasal passages, oral respiration shows their complete occlusion.

Yawning, one of the modifications of the respiratory act, if it recur frequently, denotes great failure of the vital powers and is an unfavorable prognostic element.

12. The Pulse.—To obtain any reliable data from the pulse it must be felt during perfect quiet. During sleep is the best time, but if the child cannot be caught in this condition, advantage may be taken of its placidity while feeding or amused by a toy. With very young infants it is sometimes impossible to feel the beat of the artery at the wrist, and it is necessary to ascertain the frequency of the pulse by listening to the heart. After the second month feeling the pulse at the wrist in the ordinary way is not difficult.

The child's pulse differs from the adult's by being much more frequent, more irregular, and more irritable.

The frequency, or the number of beats per minute, varies with the age. The following is the average rate:—

From birth, to the 2d month	160 to 130
From the 2d to the 6th month	130 to 120
" " 6th " 12th "	120 to 110
" " 1st " 3d year	110 to 100
" " 3d " 5th "	100 to 90
" " 5th " 10th "	90 to 80
" " 10th " 12th "	80 to 70

These figures represent the pulse in a waking but passive state. During sleep the frequency is less. Thus, between the second and ninth years, there are about sixteen beats less per minute while asleep than when awake; between the ninth and twelfth years, eight less; and between the twelfth and fifteenth years, only two less. Below the age of two years the disparity is even greater.

The irregularity of the pulse in childhood is confined to an alteration of the rhythm. It is most marked in infants and is greatest during sleep, when the pulse is slowest.

The feature of irritability, that is, the facility with which its frequency is increased by muscular activity and mental excitement, is greater in proportion to the youth of the child. A rise of 20, 30, or even 40 beats a minute is not uncommon in early infancy, under the excitement of the slightest effort or disturbance.

Examples of Variations in Disease.—On account of the wide variations in health, little meaning need be attached to alterations of the rhythm and frequency while unassociated with other abnormal features. When so associated they become important in determining the existence of disease.

Increased frequency is a constant attendant of the febrile state. The extent of the increase corresponds with the degree of elevation of temperature, though the pulse curve always runs higher than the temperature curve. As a rule,

the more frequent the pulse the higher the fever. In estimating the risk of the increase, however, the law of the fever in question must be taken into consideration. For example, in scarlatina a pulse of 160 is usual and not indicative of special gravity. In measles, the same degree of acceleration would be abnormal and show great danger.

Jaundice and inflammation of the kidneys are accompanied by a diminution of the rate.

Irregularity is met with in diseases of the brain and heart, and sometimes in nervous and blood-impoverished children.

13. The Temperature.—By placing the hand upon the surface of the body we can readily detect marked variations in the temperature; thus the nose and extremities feel cold in diseases associated with depression of the vital forces, and the palms of the hands and back of the head feel hot in those attended by fever.

But the only possible means of detecting slight variations or of obtaining reliable information concerning normal or abnormal body-heat is by the employment of an accurate thermometer. Clinical thermometers, as these instruments are called, are made entirely of glass, and are usually furnished in one or two shapes. These may be seen in Figs. 2 and 3, p. 40.

Both of these instruments are graduated according to the Fahrenheit scale and provided with a self-registering index, which is simply a short column of mercury separated from that in the bulb of the thermometer.

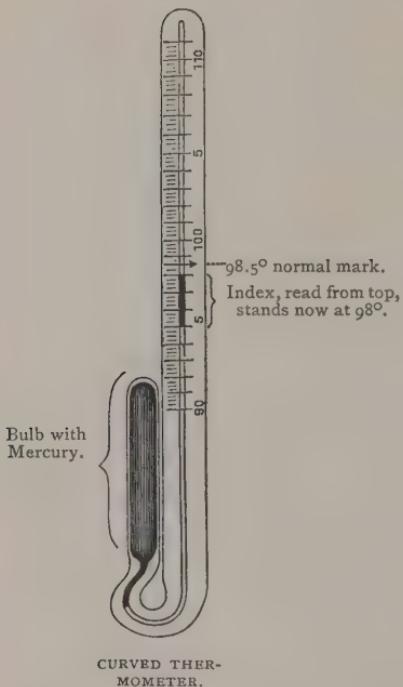
Temperature is usually taken in the rectum of the infant or young child, in the arm-pit of one old enough to understand the importance of keeping the arm in the proper position, and in the mouth of a child still older. In the first locality a straight thermometer is the best to use, in the last two a curved instrument will be found more convenient.

Supposing the rectum be chosen as the place of observation, it is first necessary to be sure that this portion of the gut is free from faeces. The upper end of the stem of the

FIG. 3.



FIG. 2.



STRAIGHT THERMOMETER.

thermometer is then held between the thumb and finger, and the index, by a few vigorous shaking movements, is

forced down so far that its upper extremity will be well below the normal mark, to 95° for instance; next, the bulb is covered with sweet oil or vaseline and gently inserted through the anus into the rectum for a sufficient distance to conceal completely the mercury. Here it is allowed to remain for five minutes by the watch, and on being removed the degree of temperature is read from the *top* of the index. The position of the patient in the meanwhile is upon the back, on the nurse's lap, with the legs elevated and controlled by her left hand, the right hand being used in steady-ing the thermometer.

If the arm-pit be selected, the child is placed on his back, and this region dried of all moisture; the index is next shaken down and the bulb inserted well into the cavity; the arm must then be laid across the chest, the hand placed on the opposite shoulder and held in this position for five minutes.

When taking the temperature in the mouth it is well to direct the child to lie down on his back and instruct him not to bite upon the delicate glass. Then, having seen that the instrument is thoroughly clean and that the top of the index is below the normal point, the bulb must be inserted, cross-wise, beneath the tongue, the teeth lightly closed so as to hold it in position, and the lips closely shut about its stem. For the *three* minutes necessary to complete the observa-tion, breathing must be performed entirely through the nose.

One more fact is important, namely, that a simultaneous observation in the three positions mentioned will not fur-nish identical results; the rectal temperature being, nor-mally, from 1° to 2° higher, and the oral at least 1° higher, than that of the arm-pit in the same individual.

When properly used the thermometer is of great value

in the nursery; at the same time, under opposite conditions, it may be the source of much unnecessary alarm to over-anxious parents. To prevent the latter misfortune all who intend to use the instrument should be familiar with the healthy range of temperature and the more characteristic variations in disease.

During the first week of healthy life the temperature fluctuates considerably. After this the puerile norme—98.5° to 99° F.—is established, but until the fourth or fifth month it is greatly influenced by physiological causes of variation, the fluctuations ranging between .9° and 3.6°. By the fifth month regular morning and evening oscillations begin to be noticeable, and certain definite laws are followed. Thus there is a fall in the evening of 1° or 2°. The greatest fall occurs between 7 and 9 P.M., and the minimum is reached at, or before, 2 A.M. After 2 A.M. there is a gradual rise, the maximum being reached between 8 and 10 A.M. Throughout the day the oscillation is trifling. These variations are independent of eating and sleeping.

It may be taken for granted, therefore, that a temperature between 98° and 99° in the morning and 97.5° and 98.5° in the evening is the range to be expected in a healthy child beyond the age of five months.

Examples of Variations in Disease.—In disease there may be either a rise above or a fall below the normal standard.

Fever is always associated with an elevation. Rapid and transient rises attend slight catarrhs and passing indigestions. Prolonged rises indicate inflammatory and essential fevers, for example, typhoid, scarlet fever and measles.

The *degree* of elevation marks the type of the fever. This is moderate when the mercury stands at 102°, severe at 104° or 105°, and very grave above 107°. The *duration* of the elevation and the peculiar *range* of the oscillations

(for there are oscillations in disease as well as in health) determine the nature of the fever. The febrile oscillations differ from the healthy, in that the lowest marking is noticed in the morning, the highest in the evening.

Variations in the typical range of any given fever are important prognostic omens—a sudden fall of the temperature, together with improvement in the general symptoms, indicates the beginning of convalescence—a similar fall, with an increase of the general symptoms, is a precursor of death. When the morning temperature is equal to that of the preceding evening, there is great danger; if higher, greater danger still. Marked remission in continued fevers is generally a forerunner of convalescence.

Abnormal depression of temperature is occasioned by hemorrhage and by the loss of fluids in cholera infantum or entero-colitis. It is also met with in anæmia, in wasting from insufficient nourishment, in diseases of the heart and lungs attended by imperfect oxidation of the blood, and it constantly attends collapse and the death agony. A temperature of 97° is dangerous in children, and for every degree of reduction below this point the risk for life is more than proportionately increased.

14. The Mouth and Throat.—In infants, gentle pressure of the fingers upon the chin is sufficient to cause wide opening of the mouth. An older child will frequently open the mouth when requested, but if he refuse, the finger, the handle of a spoon, or some other smooth, flat instrument, may be inserted in the mouth and downward pressure made upon the tongue, when the jaws will be widely separated. In some cases, when the child is old enough to do as he is bid, the fauces can be seen by directing the mouth to be opened wide and the tongue to be alternately protruded and retracted, or a prolonged sound of "*Ah*" to be made.

With the refractory, and always with infants, the tongue has to be held down by a spoon-handle or tongue-depressor. If there be resistance, the patient must be taken on the lap of the nurse, who holds his back against her breast, directs his face toward a bright light, and controls the movements of his hands and feet.

The healthy oral mucous membrane has a deep pink color, and is smooth, moist and warm to the touch. The color is deeper on the lips and cheeks, lighter on the gums. The latter, up to the sixth month, as a rule, have a moderately sharp edge. Subsequently, the edge begins to broaden and soften, and the color of the investing mucous membrane deepens to a vivid red, and becomes hot, as the teeth begin to force their way through.

The tongue should be freely movable. It is pink in color, and the dorsum or upper surface, marked in the centre by a slight longitudinal depression, has a velvety appearance, and is soft, moist and warm to the finger. The velvety nap is due to the numberless hair-like processes of the filiform papillæ. There are also scattered over the surface, but most closely at the tip, a number of eminences, the size of a small pin's head, circular in outline, and deeper pink than the general surface—the fungiform papillæ. While far back, defining the papillary layer, are the circumvallate papillæ, numbering about twelve, and arranged in a V-shaped row. These have the form of an inverted cone, surrounded by an annular elevation.

The hard palate, or roof of the mouth, is roughened anteriorly by transverse ridges. The soft palate—its continuation—is smooth, and its mucous membrane is paler than that of the rest of the mouth. The fauces, or walls of the throat, on the contrary, are redder. In the triangular recess between the half arches of the palate the tonsils can

always be seen. They should be about the size and shape of almond kernels, and they present a number of circular openings, the orifices of pouches, into which the follicles open. The uvula—or, in popular language, the palate—is short and tongue-shaped. The posterior wall of the throat should be red, smooth and moist.

Examples of Variations in Disease.—Fever makes the mouth hot and dry, and causes the tongue to be frosted or coated. Affections of the gastro-intestinal tract are usually attended by coating of the tongue. Inflammation of the mouth itself reddens the lining membrane, makes it hot and tender to the touch, increases its moisture, alters the surface of the tongue and leads to the formation of aphthæ, to ulceration, and even to gangrene.

15. Dentition.—The eruption of the twenty milk teeth may, like other physiological processes, be unattended by noticeable symptoms, but in many instances it is accomplished with difficulty, giving rise to disturbances which, on the one hand, may be so trifling as simply to annoy the infant, or, on the other, so serious as to endanger life.

Normally, the teeth are cut in groups, each effort being succeeded by a pause or period of rest. The diagram and table on page 46 show the grouping, the date of eruption and the duration of the pauses. The numbers, 1 to 5, indicating the groups to which the individual teeth belong and their order of appearance, and the letters *a* and *b* the precedence of eruption in the different groups.

The pauses are, to say the least, most helpful, giving the infant's system an opportunity to rest after each effort, to recover from any coincident illness, and to prepare for the next strain.

Even under normal conditions the edges of the gums lose their sharpness and become swollen, rounded and reddened

as the teeth approach the surface. At the same time the saliva is increased in quantity, and the mouth is unnaturally warm and the seat of abnormal sensations, evidenced by the tendency to bite upon any object that comes to hand; in other words, there is a condition of mild catarrhal stomatitis. The consequent discomfort, though, is not sufficient to interfere with the child's appetite, good humor or sleep, and

FIG. 4.

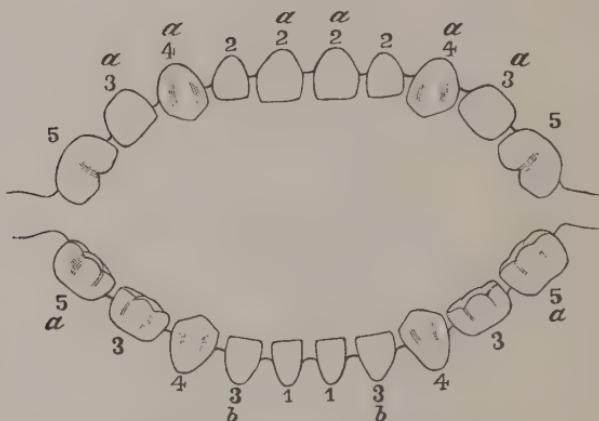


DIAGRAM SHOWING ERUPTION OF MILK TEETH.

1 α , Between the 4th and 7th months. Pause of 3 to 9 weeks. 2 2 2 2, Between the 8th and 10 months. Pause of 6 to 12 weeks. 3 3 3 3 3, Between the 12th and 15th months. Pause until the 18th month. 4 4 4 4, Between the 18th and 24 months. Pause of 2 to 3 months. 5 5 5 5, Between the 20th and 30th months.

when, after a few days, the margin of the tooth is free, all the local symptoms vanish.

Examples of Variations.—Abnormal dentition is manifested either by departures from the laws of development already stated, or by actual difficulty in the process of cutting.

The standard rules for the eruption of the teeth may be departed from in three ways:—

1. The appearance of the teeth may be premature. Children may be born with one or more of their teeth already cut; these are usually imperfect, and soon fall out, to be replaced, at the proper age, by well-formed milk teeth. Sometimes, however, they remain permanently, as in a case that came under my own observation. Natal teeth are always incisors. Instances of the lower central incisors being cut in the third month are not uncommon. Girls are more apt than boys to cut their teeth early, and, as an early dentition is likely to be an easy one, the occurrence is to be looked upon as fortunate.

2. Dentition may be delayed. This deviation is more frequently seen and of more consequence than the first. Bottle-fed babies, as a class, are more tardy in cutting their teeth than those reared at the breast. With such, though healthy in every respect, a delay of one or two months is a common and not at all a serious event. On the contrary, whatever the method of feeding, if no teeth have appeared by the end of a year, it may be assumed that the child's general nutrition is faulty, or that rachitis is present. Delay does not necessarily imply difficulty in cutting the teeth, though the two conditions are often associated.

3. The teeth may appear out of their regular order. Bottle-fed infants are most likely to show this irregularity, which is of some importance as an indication of general feebleness. In other instances, however, it is merely a family peculiarity, and, as such, bears no special significance.

Difficult dentition gives rise to two classes of affections, viz., local, and sympathetic or reflex.

The third and fourth groups of teeth are most prone to make trouble, and when the child is born at such a time of the year as to bring the eruption of these during the hot months, illness of some sort may be anticipated. This is

often dangerous and sometimes fatal, hence the popular dread of the "second summer."

The order of eruption of the permanent teeth is as follows:—

The two central incisors of lower jaw, from the 6th to 8th year.

" " " " upper " " 7th to 8th "

" four lateral " " 8th to 9th "

" " first bicuspids, " 9th to 10th "

" " canines, " 10th to 11th "

" " second bicuspids, " 12th to 13th "

These replace the temporary teeth; those which are developed *de novo* appear thus:—

The four first molars, from the 6th to 7th year.

" " second molars, from the 12th to 13th year.

" " third molars, from the 17th to 21st year.

There are, therefore, twelve more permanent teeth, making thirty-two in all—sixteen in each jaw.

Second dentition is a common cause of ill health in late childhood. The disorders produced by this process, however, are not so well defined nor so dangerous as those of primary dentition, and, in consequence, the relation of cause and effect is often overlooked.

It is probable that the first and seventh sets are the most apt to give rise to both local and constitutional disturbances.

CHAPTER II.

THE NURSERY.

Every well-regulated house in which there are children should be provided with two nurseries, one for occupation by day, the other by night.

Before entering further into the subject, however, attention must be directed to the fact that the American city-bred child, belonging to the class in which it is possible to provide separate rooms for nurseries, is to a greater or less degree a migratory creature. For when the first warm days of May or early June make the parents bask at open windows, the child is hurried off to a suburban hotel or farmhouse or to the sea-coast. Again, so soon as the cold evenings of late September suggest the comfort of an open fire, equal energy is exhibited to get him back to cosy winter quarters. In summer, most of the waking hours are spent in the open air, in winter, the greater proportion indoors, hence the day nursery must be regarded as a winter resort, and as such must possess qualities that would render it uninhabitable by the child in hot weather. The night nursery should have, though to a much less degree, the same qualities. In other words, to put the whole subject in a nutshell, the nurseries for winter use should be warm and freely exposed to the sun; for summer use, cool and rather shaded, though always perfectly dry.

Since the child spends so much time in the open air during warm weather, the nurseries will be discussed in this chapter purely from their winter standpoint, and will be described under the following heads:—

Situation.—Any room in the house will not do for a day nursery. Rather, on the contrary, must the best room be selected. It should have a southwest exposure, and be, if possible, so situated in the building as to allow of at least two broad windows,* one in the southern end and one in the western side. Into such a room the sun plays with full force from a few hours after rising until nearly the time of setting. The third floor of the house is a better elevation for the nursery, especially if there be an attic above, than either of the lower floors, partly because such rooms are remote from the ordinary domestic disturbances, but chiefly because they are drier and more readily heated, and being elevated, are less cut off from sunlight by surrounding buildings.

The night, should adjoin and communicate with the day nursery, and have a good-sized window so placed that it will freely admit sunlight during the day. The opening of communication must be capable of being completely closed by a well-fitting door or folding doors, so that one room may be thoroughly aired without chilling the other.

Neither apartment ought to communicate with a bath-room having sewer connections; in fact, although it may be an object of complaint from the nurse, the further off such a bath-room is, the better for the health of the child.

While it is a matter of difficulty to accomplish in an ordinary city house, it is, nevertheless, a capital thing to have the nurseries in close proximity to, or even in communication with, the apartment in which the parents sleep; for then the nurse is forced to be morally purer and physically more attentive than if she had a section of the house to herself.

Many mothers prefer to keep their children at night.

* Nursery windows must always be strongly barred.

Under this condition, the bedroom becomes the night nursery, and its situation must be as carefully selected, and its hygiene as particularly guarded, as the regular night nursery; when, too, there are several children in the family, the risk of overcrowding in such apartments must be recognized and carefully guarded against. The factor of disturbed rest, by the different hours of retirement of children and parents, is, also, one of importance. On all of these accounts, a night nursery, under the control of a competent nurse, is, in my opinion, to be preferred.

Size.—The amount of atmospheric air required by a healthy child to accomplish thorough oxidization of the blood in respiration is about the same as that demanded by adults. Therefore the smallest admissible room for either a day or night nursery for a single child must have a capacity of eight cubic feet. For more than one child the rule ordinarily given is, to multiply this figure—eight cubic feet—by the number of individuals. This rule works well enough for a family of two or three children, but if the number be greater, the size of apartments required would much exceed any that could be found in ordinary houses. Lack of space, then, must be made up by more perfect methods of ventilation. To put the question in a more practical form, a room nine or ten feet high, twenty feet long and fifteen feet broad will readily accommodate, either for playing or sleeping purposes, two or three children, with one attendant, provided foul air be constantly removed and fresh air supplied by ventilation.

In every room the undermost stratum of air, and the one in which the child must pass the greater part of his time, whether awake or asleep, has a much lower temperature than the middle, and this, again, than the highest—the tendency of the heated air being always to rise to the top.

Now, the greater the height of the apartment, the cooler will be the floor and its neighborhood; consequently, a lofty ceiling—namely, one over ten, or, at most, twelve feet—while it makes an imposing show, is far from being desirable for a nursery, where ease of heating and the comfort and health of the occupants are the ends to be attained. On the other hand, a ceiling less than eight feet high will tend to make the room close, stuffy and over-warm, and correspondingly unhealthy.

Lighting.—As already indicated, the only permissible light for a day nursery is that derived from the sun, and the more plentiful this is, and the more directly it enters, the better. The night nursery may be illuminated by gas, by an oil lamp, by a candle or a night light. Writers ordinarily recommend the last three, upon the supposition that gas, while burning, not only consumes a considerable proportion of the oxygen of the air, but gives off certain injurious products of combustion. This may be true to a certain extent, but the disadvantages are greatly discounted by the increase in convenience and the greater safety, so far as causing fire is concerned.

Gas certainly may be used in the late afternoon and evening; so far as the night hours are concerned, should a light be constantly required, the best means of obtaining it is from one of the regular night lights.

A very admirable form of such lights is shown in Fig. 5. This light, called the “Pyramid Night Light,” consists of a low, brass stand, having a movable pyramidal glass chimney, and provided with a porcelain cup upon which the candle rests. The candle itself is about one inch and a half in height and breadth, and is so constructed that the combustible material is completely encased in a fire-proof plaster-of-Paris cup. Each candle will burn eight or ten hours.

These lights are perfectly safe and may be utilized for the further purpose of keeping food or water warm.

For occasional use at night, nothing can be better or of more ready service than gas.

The safest way to make a light is to use a safety match, and the taking of a flame from an open fire or the use of

FIG. 5.



THE PYRAMID NIGHT LIGHT.

ordinary friction matches are dangerous and to be strongly discouraged.

Furnishing.—This heading may be made to include the finish of the floor, walls and ceiling, as well as the necessary articles of furniture and their arrangement.

The floor, which ought to be laid with good yellow pine boards, should have a hard finish. To accomplish this, the crevices between the boards and all the nail holes must first be filled with putty, then, after this has dried, coated with a rapidly-drying, hard shellac varnish, next sandpapered, when the varnish has had time to harden thoroughly, and, finally, finished by a second coat of shellac. This gives a light-colored floor that brightens the room and at the same time is readily cleaned. A dark staining, besides being sombre, always looks soiled. A painted floor is not easily cleaned. Should either of the latter be already

in a nursery, they may be overcome by a well-laid parquet floor.

A carpet tacked to the floor is not to be recommended; far better is it to have rugs, which can be frequently taken up and well shaken, the housemaid having in the meanwhile free access to the floor itself.

Paint is the best finish for the walls. Individual taste will of course weigh in the selection of the color and amount of decoration, though a light tint, but still one not trying to the eyes, is most desirable. Next to paint, varnished paper is to be preferred. Within the past few years light and soft tinted fabrics, covered with the representations in figure of familiar nursery legends, have been for sale by paper dealers. Such papers render the nursery attractive to older children, and, to a great extent, take the place of pictures. Paint, however, has the advantage, in that it may be washed and thoroughly disinfected in case of the occurrence of contagious disease.

To return to the subject of pictures, it is best to interdict any that are valuable or expensively framed. A few highly-colored, striking prints taken from one of the good weekly illustrated papers, and fixed to the painted wall by glue, will give as much pleasure to the childish eye as the works of the best artists. They can, too, be changed from time to time, and after an epidemic disease can, without regret, be removed and burned, in the process of cleaning.

The ceiling of the rooms should always be painted with some light color, and be perfectly free from ornamentation.

In the matter of furniture, the day nursery should contain a table at which the older children may take their meals or use in play and study; one or more large chairs and several small ones; a plentiful supply of toys and picture books, and, if there be room enough, a chest of drawers or ward-

robe for clothing, and so on. All the furniture must be plain, that it may be more easily kept clean.

The centre of the room must be kept clear, to give an opportunity for play. The table, therefore, should be a folding one, that it may be placed out of the way against the wall and take up the least space possible when not in use. Any other heavy article of furniture must also occupy a position against the wall and be fitted with castors, so that it can be readily moved to facilitate cleaning the floor beneath.

The toys may vary in character with the age of the child—soft, white India-rubber ones for infants, more complicated mechanism for older children; but inexpensive toys are the best, because they can be most frequently changed. The same is true of books. For both, by the way, there should be a special drawer or closet provided, where they can be put out of the way when not required.

A few plants, a bird or a globe of fish add brightness to the child's room and greatly assist in cultivating good taste and in affording amusement.

The night nursery must contain the beds, the bathing and toilet utensils, several chairs—one being a rocker—a small table, a medicine closet and a chest of drawers or other convenient receptacle for clothing and extra bed covering.

It is essential to have a separate bed for the nurse and one for each child; they should be placed so as to be protected from any chance draught of air, be far enough apart to allow of a free passage between, and the bed of the youngest, or of an ill child, ought to be nearest the one belonging to the nurse.

Old-fashioned pitchers and basins are to be preferred to stationary washstands. The latter, though, are so conve-

nient—especially when supplied with hot- and cold-water faucets—that they may be permitted when the waste pipe is short and runs directly through the wall into a rain spout, instead of communicating with the sewer, and when the nurse can be trusted not to use them as a convenient means of disposing of the ordinary chamber waste.

Each child should have his or her own brushes, combs, sponges, soap and towels, and all of them must be kept clean and sweet and have a place of their own.

The medicine closet must be allowed to contain only such articles as may be often required, and can be used with safety by a person of average intelligence; for example, olive oil, vaseline, oxide of zinc ointment, talcum powder, soda mint, sweet spirits of nitre, syrup of ipecacuanha, chalk mixture, etc. Any preparation containing opium—even paregoric—is especially out of place in the nursery medicine chest.

Feeding bottles, implements for the heating and preparation of food and for bathing, also belong to the furniture of the nurseries, but their consideration may be conveniently postponed to later sections.

Heating.—Each room requires an accurate thermometer, so hung that it may record the mean temperature; not too close to the fireplace nor the windows, where it runs the chance of being unduly heated or chilled.

The temperature of the day nursery should range between 68° and 70° F., that of the night nursery from 64° to 68° .

The proper method of heating is by an open fireplace in which either wood or coal is burnt. Either of these fires is superior to a furnace, simply because they serve a double purpose, namely, heating and ventilating. My personal preference is for an old-fashioned hearth, where oak or other quietly burning logs can be used, since a wood fire is more readily lighted and regulated, and is a better ventilator than

one of coals. Still, in our climate, with its manifold and sudden changes, it is so essential to have a source of heat constantly at hand that it is difficult to banish the furnace register from any living room. Therefore, while recognizing the disadvantage of furnace heat, in that it makes the air too dry, it is well to supply the nurseries with both means of heating, using the open fire in moderate weather and the furnace only in the presence of severe cold.

In my experience, where the nurseries are so situated as to receive direct sunlight through ample windows, there is rarely any need of furnace heat except in the early morning, before the servants have time to make up the wood or coal fire.

Care must be taken to guard every open fireplace with a high fender, one that can neither be knocked down nor climbed over by an active child.

Ventilation.—In addition to furnishing ample space in the nurseries, it is necessary to provide a constant supply of fresh air by ventilation.

By all odds the best ventilator is an open fireplace in which wood is burnt. Such a fire, by creating a draught up the chimney, carries off the impure air, and there are few doors and windows so closely fitting that they prevent the entrance of fresh air to supply the place of that so removed.

Should this not prove sufficient, one of the windows may be utilized, the upper sash being slightly lowered and the lower sash slightly raised, the openings being sufficient to allow of the entrance and exit of air, but not enough to cause a current or draught in the room.

When the rooms are heated by a furnace or stove, some permanent ventilator must be used. For the egress of foul air an opening may be made into the chimney at a convenient distance from the floor; this may be guarded by an

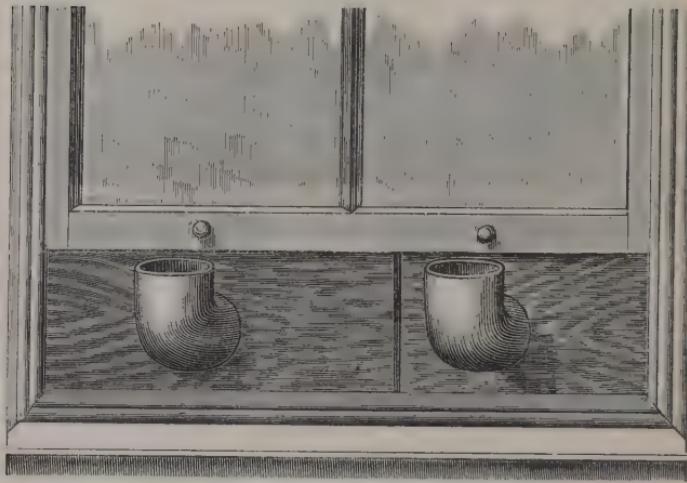
ordinary adjustable register, such as is used to regulate the entrance of heated air from the furnace flue.

The same purpose may also be accomplished by making an opening in the upper part of the door; this should be guarded by a movable sash, or by one of the ventilating appliances to be mentioned later.

To allow of the free entrance of pure air, one of the glass lights may be replaced by a plate of tin having a multitude of minute perforations, or a ventilator made to fit the window may be used.

The best of these are shown in the four following figures.

FIG. 6.

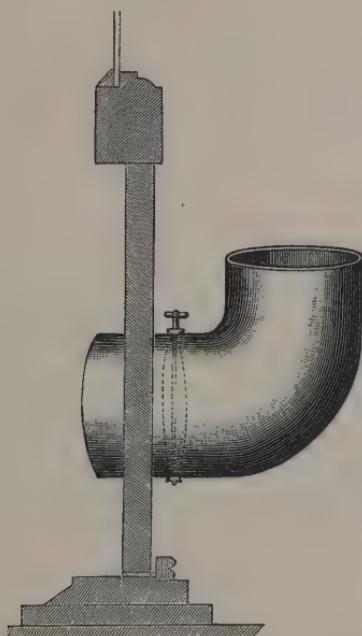


WINDOW VENTILATOR.

The above apparatus consists of two pieces of board, one of which slides upon the other, so that it may be readily adapted to any breadth of window frame. Each portion has a circular opening to which is fitted a tin or sheet-iron pipe, eight inches long by four inches in diameter, and

having a slight upward bend. These pipes are provided with a solid diaphragm, readily moved by a handle, and intended to regulate the quantity of air admitted. When in position, the pipes, of course, project inward.

FIG. 7.



WINDOW VENTILATOR IN PROFILE, SHOWING DAMPER.

The wheel window ventilator, Fig. 8, consists of a movable diaphragm and a revolving wheel, the whole varying from six to eight inches in diameter. When placed in position, which is readily done by cutting a circular hole in a window pane or in the door, the difference in temperature between the interior and exterior of the rooms will create a current and cause the wheel to revolve noiselessly. The revolving wheel, while it prevents a draught, allows of the

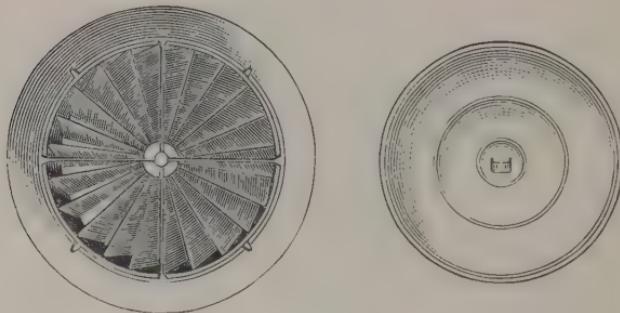
passage of two currents, that of fresh air inward and foul air outward, and the diaphragm enables one to control the supply of air.

An admirable domestic arrangement for ventilation consists of a board eight or ten inches in height placed across and close to the window sill, as in Fig. 9.

This, when the lower sash is raised, as indicated by the dotted lines, allows of a free entrance of air without a draught, the current being directed upward (as shown by the arrows).

Together with the above careful provision for constant

FIG. 8.



WHEEL VENTILATOR.

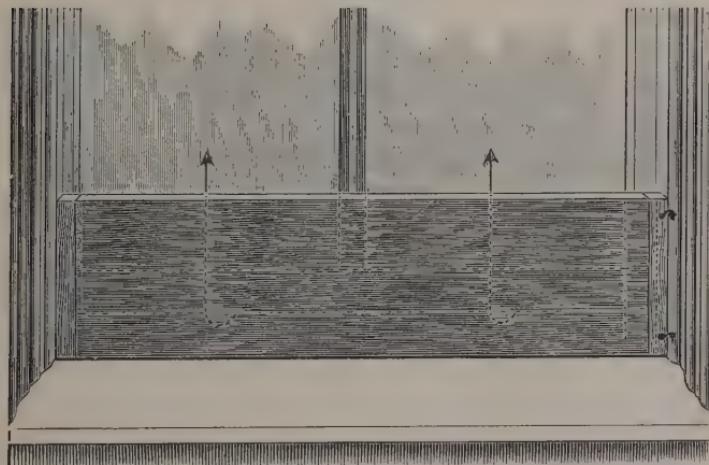
purification of the atmosphere, it is essential to "air" thoroughly both of the nurseries through widely opened windows. With the day nursery this must be done whenever the child leaves it for any length of time, care being taken to close the windows and get the temperature to the proper degree before his return. The night nursery should be aired after the children leave it in the morning and after the midday nap.

Cleaning.—It is hardly necessary to say that the nurseries must be kept perfectly clean.

The furniture, woodwork and window glass, as well as the floors, must be kept clean and free from dust by wiping with a damp cloth at least once a week.

Should there be a stationary washstand in either room, it is most important to thoroughly clean the basin every day, and to disinfect the waste pipe, however short it may be, twice every week. The latter may be done with ammonia, copperas or Platt's Chlorides. The process is very simple,

FIG. 9.



BOARD VENTILATOR IN PLACE.

and consists in pouring down the pipe a gallon or more of a diluted solution of either of the above articles. Copperas is the cheapest and in my opinion the best; a double handful of it in an ordinary bucketful of water forms an efficient disinfectant and deodorizer.

The substance known as Household Ammonia may be employed in the strength of two tablespoonfuls to a gallon of water, and is especially useful where there is a suspicion

that the interior of the waste pipe has become coated with a layer of soap.

Platt's Chlorides is used in the proportion of one part to four of water, and is very efficient though more expensive than either of the other materials.

Cleaning must never go on while the children are occupying the nurseries.

CHAPTER III.

THE NURSE-MAID.

While the mother is the natural guardian of the physical and moral welfare of her children, the nurse-maid has a considerable influence over both; for the former, however anxious and watchful, has so many other duties, both domestic and social, that she must absent herself at times from the nursery; the latter, on the contrary, lives there. Day and night she has the care of the children, attending to their apartments, to their persons, food and clothing, participating in their amusements and exercise, and watching over their sleep. The selection of the nurse-maid, therefore, is a matter of much importance.

The celebrated Dr. West, in discussing the nursing of sick children, makes the following statement in regard to a nurse's qualifications: "Indeed, if any of you have entered on your office (hospital nursing) without a feeling of very earnest love to little children—a feeling which makes you long to be with them, to take care of them, to help them—you have made a great mistake in undertaking such duties as you are now engaged in." Now, though this was addressed to those who were occupied in caring for ill children, it is alike applicable to the nurse whose chief duties are with the healthy.

Love of children, therefore, is essential in a good nurse, but it must be combined with several other traits of character, since love alone will not compensate for such faults as stupidity, inexperience, forgetfulness and lack of judgment.

What, then, are the qualifications to be sought for?

1st. The woman should be in the prime of life, between twenty-five and fifty, for example. For if she be under the former age, she is apt to be frivolous and think more of her "afternoon out" and of her male friends than of her charge, while if over the latter, besides being set in her ways and opinionated, she is usually too worn out for efficient day service and too prone to heavy sleeping to be trusted for night duty.

2d. Strength, activity and freedom from disease are necessary. The first quality does not always go with a large accumulation of flesh; in fact, the reverse is apt to be the case. A stout nurse looks motherly and comfortable in the nursery, but she may, by her very bulk and consequent heat-producing power, render a young infant wretched in warm weather. I should avoid such an one as much as I should another whose back pained when she swept the floor or carried the baby out for an airing.

Consumption of the lungs, indicated by a cough, and syphilis, indicated, usually, by an eruption upon the skin, are two diseases to be especially avoided. Besides these two, which are to be shunned because they positively endanger the child's health, there are others that, without doing appreciable harm, render the sufferer's presence unbearable in the nursery. These chiefly offend through the sense of smell, as in the case of old leg ulcers; too freely perspiring feet; over-active axillary glands; certain forms of chronic catarrh of the nose, throat or tonsils; and of decayed or badly kept teeth.

3d. While beauty is not to be specially sought after, the maid's face should, at least, have a pleasant expression. A markedly homely or sinister face is a disadvantage, and still more so any decided deformity. This reference to personal appearance, at first sight, perhaps, seems trivial, but any one

who has seen much of children cannot fail to notice how a young child will crow and hold out his arms to the bearer of a placid, comely and smiling face, and turn away from one that wears a sombre and unsympathetic expression. Much is said about the magic of touch in managing young children, but I have observed that their eyes always seek the face and eyes of those about them, and that it is what they see there that guides their instinct for like or dislike.

4th. Children resemble dogs and horses so far as the instinct of knowing those who love them is concerned, and the element of love toward babies is, as already hinted, the most important feature in the disposition of a nurse. A woman having this quality will never be cross or impatient, and, by the very contagion of her good nature, prevents her charges from being fretful and makes her nursery happy. Besides love, with the patience and consideration it implies, truthfulness is a most important trait of character, not only for the physical welfare of the child, but also that, since children are such imitative creatures, the bad habit of lying may not be formed.

A truthful, loving woman is generally a cheerful one; if not, her place is out of the nursery, for children must be happy to be healthy, and the constant contact with sadness will bring unhappiness to any child.

5th. The nurse-maid should have a sufficiently developed mind to follow out and remember general directions, whether given by the physician or mother, and to do routine work without constant supervision. A certain amount of experience is a good thing, and on this account it is a recommendation for a woman to have had a partial hospital training, to have nursed children before, or to have been a mother. On the other hand, one must beware of the self-opinionated maid, who, having cared for several children,

thinks she knows everything, and will be controlled by neither professional nor maternal directions. Such women are as ignorant and inefficient as they are common.

6th. Cleanliness is essential in a nurse. A slovenly maid will keep neither her children nor their nurseries clean. Therefore insist upon the nurse not only washing her face and hands as occasion requires, but upon her bathing her whole body two or three times a week, and upon her wearing fresh, well-aired clothing.

7th. So far as habits are concerned, absolute temperance and early rising are the most desirable. Early rising, however, implies an early hour of retiring, and care must be taken to afford ample facilities for so doing.

8th. Every nurse-maid should be impressed with the importance of informing the parents of all conditions connected with the health of the child that may demand attention, and of revealing at once any injury that may have been sustained.

CHAPTER IV.

CLOTHING.

In introducing this subject, it may be well to call attention to two important points that are often either unrecognized or overlooked.

1st. All children, but particularly infants, have little power to resist the depressing influences of continued cold, and on this account require warm clothing.

Too much cannot be said against the fashion which, for the sake of supposed beauty, demands that children should be dressed in a way to leave their legs and knees bare. Even in the house, and except in extreme tropical weather, this barbarous practice is injurious, as it exposes a considerable part of the body to constant chilling. The physician knows, and the intelligent layman should be readily convinced of the bad effects of such protracted abstraction of body-heat. The explanation is simple: every child is supplied by nature with a certain definite quantity of nerve force destined to be expended each day in maintaining what physiologists term "the functions of the body," namely, breathing, circulation of the blood, digestion, heat-production, and so on. Now, if an undue proportion of this nerve force be consumed in producing body-heat, as must be the case when so large a surface is left bare, the other functions must be robbed of force. From this robbery the digestion suffers most. With feeble digestion comes constipation or its opposite, diarrhoea. Again, if the surface be chilled, the blood which should circulate in the skin is driven to the interior of the body, and the vessels of the mucous

membrane become surcharged. This surcharging, or congestion, causes the condition known as catarrh, which, affecting the lining membrane of the alimentary tract, causes vomiting and diarrhoea; and, in the case of the lungs, bronchitis.

2d. Infants and children have soft tissues. This statement applies as well to the bones as to the muscles. Therefore, the clothing should fit loosely, that it may not interfere with the motion of the limbs, with the rise and fall of the chest in respiration, or with the necessary freedom of the muscles of the abdominal wall or intestinal canal, one of which is concerned in respiration, the other, in the no less important function of digestion.

Let the clothing, then, be warm and loose.

Thought for the infant's clothing must begin before its birth, with the filling of the "baby's basket." This should contain the following articles:—

- A nainsook slip.
- A flannel skirt.
- A merino shirt, high neck and long sleeves.
- A flannel band, twenty-two inches long and six inches wide.
- A soft woolen shawl, to be used for a wrap in cold weather.
- Worsted socks.
- Two linen diapers.
- Large and small safety-pins.
- One pair blunt-pointed scissors.
- Two soft towels.
- Castile soap.
- Small silk sponge.
- Powder box and puff.
- Soft hair brush.
- Cold-cream or vaseline.

Linen bobbin.

Fine old linen, for infant's mouth.

So soon as the child is born and the cutting of the cord frees it from maternal connection, it is the rule to wrap it in a piece of soft flannel and place it in a position of safety until, certain necessary attentions having been rendered to the mother, a convenient time arrives for washing. After this operation, which will be described on a future page, the child is dressed for the first time. Every infant requires knitted worsted shoes, or, as they are popularly called, "socks," a napkin and an abdominal belt or "binder;" the rest of the dress—the body-clothing proper—consists usually of three garments, which vary in pattern with individual ideas and tastes.

The "socks" are made of silk thread or soft worsted yarn fashioned by needles into the shape of shoes, and of such a size as to fit the foot loosely, while covering the leg two inches or more above the ankle. They are held in position by a loosely tied tape or a narrowed band of stitches—the mechanism of which every knitter will understand—near the top. Stockings are unnecessary, and are rarely used before the clothes are shortened.

The napkin or diaper may be made either of linen or muslin, the former material being preferred, as it is less heating and less liable to cause chafing of the skin when wet. It must be folded in such a way that it may not cause pain by undue pressure upon the back or abdomen.

A soiled napkin can never be safely used a second time, even though the soiling medium be simply urine and the subsequent drying be thorough. In consequence, an abundant supply is essential. The least dampness renders its use dangerous, and while insisting upon the washing of all soiled napkins, it is equally important that they be aired for at least

twelve hours before being used again, that they may be surely dry.

The "binder" may be of fine, soft flannel or of knitted wool. In either case it should extend from the brim of the pelvis or hip bones to the lower ribs. I prefer a knitted band made narrower in the centre than at either extremity. Any woman who is handy with her knitting needles can make one, and the product has the advantages of being readily applied and of keeping its position without the aid of either strings or pins.* When a flannel band is preferred, it should be wide enough to cover the same area, and long enough to go a little more than around the abdomen. It is best fixed in position by two small safety-pins. Such a band is difficult to keep in place, collects more perspiration than the more net-like knitted binder, and the necessary pins may cause inconvenience.

Several bands are required to be on hand at the same time for the sake of proper cleanliness, and, as they should be worn up to the end of the second year, it is necessary to replace them, set by set, as the growth of the child demands.

The body-clothing is usually composed of three separate pieces: a shirt, a petticoat and an outside dress or "slip." The shirt should be long enough to extend from the neck to the lowest part of the trunk and have sleeves reaching to the wrists. It may be made of merino or of soft worsted yarn. In either case it should fit loosely and be fastened

* *Formula for Crocheted Baby-Band.*—Single zephyr in ridge stitch, that is, half stitch, in which, going back and forth, only the back half of the stitches in the lower row are picked up. Begin on a chain of fifty and crochet forty-eight ridges, hence ninety-six rows. Join by a row of tight stitches or by sewing. Finish off at bottom by a row of plain stitches and at top by a picot-edging (five chains and a tight stitch back into the first).—“Babyhood,” Vol. III, p. 33.

at the neck with tape or buttons. The petticoat must be long enough to extend from the waist to six or eight inches below the feet. Light, white flannel is the proper material, and it is usual to sew to the petticoat skirt a muslin "waist" which is deep enough to reach from the hips to the arm-pits; this portion of the garment is open behind, so as to be readily placed upon the child, and in this position is fastened by safety-pins, or, better, by two or three small buttons. The dress or "slip" is made of fine cambric, cut in one piece, opening well at the back that it may be easily slipped on, and the petticoat is fastened by tape or buttons.

Another, and I think a preferable outfit, consists, also, of three garments. The first or under garment, made of soft, white flannel, is long enough to extend from the neck to ten inches below the feet—about twenty-five inches in total measurement—with wide arm-holes and sleeves extending to the wrists. All the seams must be smooth, the hems at the neck and wrists turned outward, and the opening, necessary for ready fitting to the body, provided with a tie or small button. The next garment, cut in the same way, but one-half inch larger, five inches longer and with short sleeves, is made of muslin or flannel, according to the season, and fastened by two buttons at the neck. The slip is also cut "Princess," has long sleeves, a longer skirt than either of the other garments, and is fastened behind by small buttons.

When dressing the infant these three coverings are put together, sleeve within sleeve, and the whole passed over the little one's head, then buttoned behind, and the process is complete.

The advantages of the last method of dressing are:—

1st. Perfect freedom to the organs contained within the chest, abdomen and pelvis.

- 2d. Suspension of the clothing from the shoulders.
- 3d. Saving of time to the mother and fatigue to the infant in the process of dressing.
- 4th. A uniform covering of the whole body.

So much for the day clothing. At night the dress should consist of the flannel and the outer garment.

In the foregoing, my intention has been to lay especial stress upon the advantage of holding the garments in place by tape or buttons rather than by pins, and it should be noticed, that a baby may be thus completely dressed with but one pin in its clothing, namely, that fastening the napkin. This, which is allowed only for the sake of convenience, must be a safety-pin, the ordinary pointed pin being an abomination in the nursery.

It is hardly necessary to say that, for the sake of cleanliness, an abundant supply of body-clothing should be at hand; a mother, particularly, must recognize that "cleanliness is next to godliness," and provide accordingly. Let her remember, too, that before fresh clothing be put upon the infant it must be thoroughly "aired" or dried.

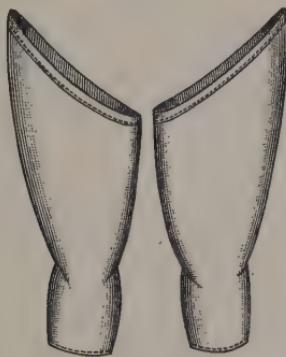
Sometimes, to keep the body-clothes dry, a piece of thin rubber cloth is placed over the napkin; this does nothing but harm, for it over-heats the parts, and when the diaper is wet with urine makes a poultice of it, and thus macerates the skin and causes irritating and painful excoriation.

At the age of six months in summer and of eight months in winter, provided, in both cases, the health be good, the clothing may be "shortened." This change introduces several important questions, namely, the covering of the legs and knees, and the selection of shoes and stockings.

The shortening process makes no change in the body-clothing except that the skirt and slip end a short distance below the knees, at about the point to which an ordinary

shoe top comes; this, of course, practically leaves the legs, from the stocking top to the lower edge of the napkin, exposed. As already hinted, it is necessary for the health of the infant to keep this comparatively large surface protected, except, perhaps, during a few extremely hot days in mid-summer. There are two ways of accomplishing this: either by drawers or by stockings long enough to extend from the feet to the napkin, to which they may be attached by safety-pins or ordinary "fasteners." The best drawers are those made in two pieces, one for each leg, as shown in Fig. 10.

FIG. 10.



DRAWERS.

These, as furnished in the shop, are made of merino, but any clever woman should be able to cut them out of canton flannel and make them at home. The point is to have them fit the legs moderately closely, and to have a buttonhole at the top, so that when passed over the napkin they may be buttoned to the waist of the skirt, on its inner side, and so held up. These drawers are not readily soiled, as they cover the legs only, and the napkin comes between. They must, of course, be made of material to suit the season—heavy in winter, light in summer.

When stockings alone are used they must be long enough to come well above the knees, and should be held in position by "supporters" instead of garters, since the latter, being necessarily tight, crease the limbs, and often, by interfering with free circulation, cause cold feet. The supporter must be adjusted to make only the required amount of traction, and this always in a direction parallel with the axis of the body. The stocking foot ought to fit easily, but without wrinkling, and at the same time have a rounded rather than a conical-shaped toe. For although the silk, woolen, or cotton material of which the stocking is composed may be yielding, it is elastic, and consequently capable of exerting a certain amount of pressure upon the foot; and there is little doubt that the persistent compression exerted by a short, sharply conical point, cramps the toes, crowds them together, and sometimes, even, forces them to overlap one another.

Colored stockings soil less readily than white, and while not so safe, are permissible, provided the coloring matter be well fixed in the texture and not of such a nature as to cause irritation of the skin. Every stocking should be turned inside out, carefully examined, and all knots and ends removed, the smallest of which hurt the tender little feet. Were this matter oftener looked to, many an unexplained tear would be avoided.

As with the drawers, so with the hose; several weights should be provided to correspond with the varying demands of the seasons for greater or less warmth, and in both cases a sufficient supply must be kept to allow of frequent changing.

The shoes are prominent items of the clothing; their shape, size and manner of fastening, and the make-up of the soles being the important matters for consideration.

An infant's feet are plumper than those of the adult, and all the tissues, but especially the bones, are softer. They may be readily deformed by protracted pressure from badly constructed shoes, despite the assertions of unhandy shoemakers, who say that the feet are shapeless masses of fat, for which any leathern bag having the semblance of a shoe will serve as a covering.

Throwing out the element of fleshiness, the perfectly formed baby and adult foot do not differ materially in characteristics. In the first place, the inner and outer margins are very different in contour. Secondly, the heel and middle third of the foot is firm and presents little mobility in its component bones, whereas the anterior third, including the toes, is very mobile. The toes again bear much the same relation to the rest of the foot as the fingers to the hand. This is particularly noticeable in the great toe, which, instead of inclining toward a line passing along the centre of the foot, points away from it, in the same manner as the thumb from the hand, although, of course, to a far less degree. An inclination of the great toe toward the mid-line of the foot is undoubtedly often seen in adults, but in them it is a deformity resulting from badly made shoes, and one that gives a conical contour to the toes, cripples the movements of the great toe, and greatly interferes with the ease of walking, just as a contraction and permanent drawing of the thumb toward the palm of the hand would materially lessen the usefulness of that member.

The normal position of the toes just described will be readily understood from the tracing of the sole of the right foot as shown in Fig. 11.

The most striking features of this diagram are, the expanded position of the toes; the width of the anterior part of the foot compared with the heel, and the straight

outer and curved inner margins of the foot. The line, A B, represents the axis of walking, which, while nearly parallel to E F, the inner edge of the foot, forms quite an angle with C D, the centre line.

In the normal foot the great toe is directly in the axis of walking, a position in which, of course, it is of much greater service than if it were inclined inward toward the line C D.



TRACING OF NORMAL FOOT.

Now, if a line be drawn closely around the margin of the above imprint, it will give the exact shape of a perfect shoe sole for the right foot; or taking the imprint of both feet, we get the outlines shown in Fig. 12.

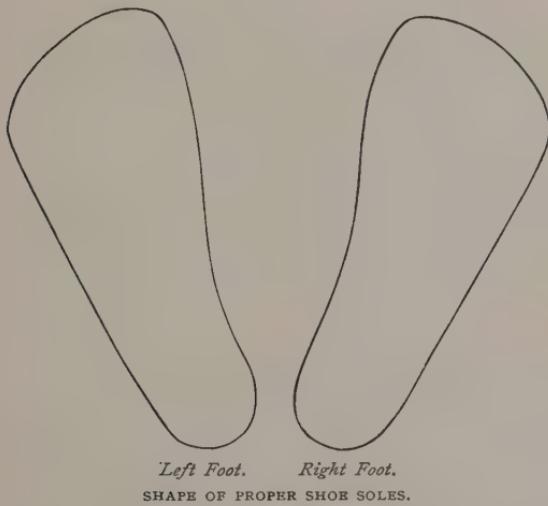
On first sight, one would suppose that a shoe with a sole so shaped would look very awkward, but when made by a

skillful shoemaker, it differs very little in appearance from those ordinarily sold in the shop, with the exception that it is broader in the toes.

Another important fact is clearly demonstrated by Fig. 12, namely, the absolute necessity of having the shoes made "right and left," and the fallacy of supposing that one or other shoe may be used on either foot indiscriminately.

Besides having a correct shape, the shoes should be long

FIG. 12.



SHAPE OF PROPER SHOE SOLES.

enough not to cramp the toes and bend them down and backward upon themselves. At the same time it is a mistake to have them too long, allowing the foot to slide back and forth, as this leads to the formation of either blisters or corns. Let the shoe fit snugly about the heel and instep, and easily at the toes, and all is well. I say easily at the toes, because many an otherwise good shoe is ruined by having the uppers at the points too scanty, so that the

toes are forced against the sole and subjected to painful pressure.

The best method of fastening is by a lace, since this admits of making one part of the upper tight and another part loose, according to circumstances.

Elastic fastenings, as in so-called congress shoes, are not good for children, and when buttons are used, the nurse must not necessarily leave them in the position fixed by the shoemaker, but move one or more as the size of the ankle demands.

The thickness of the soles depends upon the age of the child. Before walking is attempted, they may be thin, flexible and of uniform thickness from heel to toe; afterward they should be made heavier and more resisting, in order to protect the tender feet, and should be decidedly thicker at the heel, that this part of the foot may be elevated. A clear-cut heel, however, as in adult boots, is not to be recommended in children's shoes before the age of six or eight years.

Sometimes a careful mother may notice that, for a short time after stockings and shoes are put upon her baby, the feet are cooler than before. Undue pressure about the ankle, with consequent interference with the blood circulation in the feet, is the cause of this, and to remedy it remove occasionally the coverings; chafe the feet into warmth, and see that the shoe-top is not so tightly laced or buttoned as to constrict the ankle.

So far, all that has been said of the clothing after "shortening" refers to the day and house garments. It remains now to consider the night dress and the extra wraps to be worn out of doors.

At bedtime, all the clothing worn during the day being removed, the baby is washed, and after the application of a

fresh napkin and binder is ready for the night dress. This consists of a shirt and an especial gown. The shirt should always be of flannel, a light gauze in summer and a heavier wool in winter; its pattern may be the same as that worn by day, though its texture ought to be a trifle lighter. The best pattern of a winter night-gown is a long, plain slip, with a drawing string at the bottom, to prevent exposure of the feet and limbs, should the child kick off the bed covering during sleep. It ought to be made of flannel, or the more easily washed Canton flannel. In summer, a loose muslin slip of the same design, but without the drawing string, may be worn. There is even more temptation by night than by day to use a rubber cloth over the napkin, to protect the body and bed clothing, but never do this.

When dressing a child for exercise in the open air in cold weather, do not put on the extra, outer clothing until immediately before leaving the house, and remove it directly on returning. A long cloak, with or without capes or fur, according to the degree of cold, and a pair of long, warm leggings, constitute the extra coverings for the body. Protect the head, in winter, by a close-fitting, thick cap; the hands by worsted gloves or mittens.

In summer the child may go out of doors in the same dress worn in the house, the head being protected from the direct rays of the sun by a broad-brimmed, light straw hat.

It is a good plan to provide the child with a flannel garment corresponding to the dressing-gown of the adult, and with a pair of bedroom shoes. The latter are composed of soft leather or felt soles and knitted uppers, and are fastened around the ankle by a soft elastic. Both of these will be found useful in the many occasions when the child has to be taken up at night.

Every mother must decide for herself when her child is

to doff the costume of babyhood and assume that of the boy or girl. There are two points that must always be considered, however, namely, the time of dispensing with the napkin and with the abdominal belt. Abandon the napkin, and substitute ordinary drawers, as soon as the child can be trusted to make known the calls of nature—a period that varies considerably with the care and skill in training. The binder should always be worn until the completion of the eruption of the milk teeth, or until about the end of the second year.

In clothing the boy or girl, be particular to secure warmth, freedom of movement and cleanliness. The first is accomplished by enveloping the whole body—no matter what the season—in woolen underclothing. This means high-necked and long-sleeved flannel shirts and flannel drawers extending down to the ankles. It is hardly necessary to mention that the thickness of these garments must vary with the seasons, but it is quite worth while insisting upon woolen under-garments, except during the very excessively hot days of midsummer. This provision being made, and the shape of the shoes and stockings* looked into, it matters little what may be the fancy of the mother in regard to outer clothing.

Freedom of movement refers not only to the limbs, but to the chest and abdomen, which should never be constricted, lest the important organs they contain be crippled in their action. Loose-fitting clothes accomplish this object; but it is to be understood that looseness or ease in fit

* It is impossible for either a stocking or shoe to fit accurately unless the toe nails be kept in good order. In cutting the toe nails there is, as in every other affair of life, a right and a wrong way. Cut the nail directly across, without rounding the corners. Should the latter be done, the nail is apt to grow into the flesh and give suffering to the child and work to the surgeon.

does not necessarily imply that the dress must be awkward, ill-fitting and a source of mortification to the wearer. On the contrary, clothes may be easy and yet well cut, and stylish.

To be clean, the child only requires a plentiful supply of clothing, so that changes may be made as frequently as required. Clean, cheap clothes look much better than soiled finery.

The night dress of a child five or six years old consists, during winter, of a light, high-neck and long-sleeve merino shirt and night drawers of Canton flannel; in summer, of a gauze undershirt, with short sleeves and muslin night drawers.

Cold weather calls for a warm overcoat, hat, mittens and leggings, or rubber boots in wet or snowing weather, when the child leaves the warmth of the house. Should the cold be so great as to necessitate ear tabs and a neck wrap for protection, a child under six years is better off in the nursery.

Before concluding this chapter, let me advise that the change from winter to spring or summer clothing be not made at any fixed date, under the supposition that it is the time to change, and the weather should be warm, whether it is or not. In our Eastern climate it is unusual to have settled, warm weather until June. May has a certain number of warm days, but they are quickly followed by cooler ones. Consequently the safe plan is to keep on the heavy winter flannels until hot weather surely sets in, changing, in the meanwhile, the outer clothing to suit each day.

CHAPTER V.

EXERCISE AND AMUSEMENTS.

Healthful exercise, especially when taken in the open air and sunshine, invigorates the nerves; secures an active performance of such vital functions as circulation, respiration and digestion; maintains a hearty appetite and regular movement of the bowels, and develops the muscles.

Symmetry of development is essential, and on this account any exercise or play that brings but one or a few sets of muscles into action, must be discountenanced. The muscles control the bones, and should one set be comparatively feeble, the bones they move are dragged out of form by stronger opposing sets. Probably the most important groups of muscles to render strong are those of the back which hold the spine in proper position. When these are weak—the greatest weight of the trunk being toward the front—the backbone has a tendency to be drawn forward in such a way that the movements of the chest are crippled, and respiration so interfered with, that the blood is imperfectly aerated, nutrition fails, and the child becomes a weak, puny invalid.

Curvature of the spine—the deformity here referred to—may also interfere with other functions; for instance, digestion, elimination of urine and the motion of the legs. Bone deformities are more apt to occur in children than in adults, because, in the former, the bones, not being thoroughly set and hardened, are more readily influenced by irregular muscular action.

Marking, then, the necessity for equal muscular development, the subject of exercise may be taken up in detail.

The first exercise the infant gets will be in the nurse's arms. Shortly (three or four days) after birth the babe may be taken from its crib two or three times a day, and, being placed upon its back on a pillow, carried about the room for ten or fifteen minutes. In the second month, longer walks may be taken, the pillow being discarded and the infant carried in a reclining position in the arms, with the head and body thoroughly supported.

By the fourth month the child will have gained sufficient muscular strength to maintain a sitting posture for a short time, provided the head and shoulders be supported by the nurse's hand, and in this way it may be carried about on the right or left arm—and it is most important not to use one arm constantly—for its daily training.

At the end of the eighth month a healthy child ceases to require support to the head and back when carried, but not before.

After the infant ceases to be merely a sleeping and eating animal, and begins to show signs of humanity, at about the fourth month, for example, he should be laid upon a soft mattress or sofa several times each day and allowed to do as he pleases.

Under these circumstances, he rolls about and kicks his legs, clasps and unclasps his fists, moves his arms, and crows or cries. All of these movements serve a purpose; the legs gain strength for future walking, the hands for grasping, the arms for carrying, and the vocal organs for speaking.

A certain class of nurses seem unable to comprehend that a baby is a tender creature; tender not only in age, but in the texture of all its tissues. They support a young infant upright upon their knees and violently jolt it up and down, under the supposition that it gives pleasure, and should the child cry they add to its torment by a peculiar "song."

Gentle movement is as pleasant to the child as riding in an easily running carriage on a smooth road to an adult; knee-jolting as unpleasant and harmful as a journey over the worst corduroy road. The so-called singing must cause only pain.

The question of out-door exercise arises soon after birth. Daily airings are requisite for perfect health so soon as the child has arrived at the proper age, and providing always that the weather be favorable. The fifth month is the proper age for children born in the early fall and winter, and the second month, for those born in summer. In cool weather they should be taken out in a coach or in the nurse's arms, for an hour in the morning and half an hour in the afternoon, while the sun is shining. In summer, they may pass the greater part of the waking hours in the open air. In damp and rainy weather, when there is a strong east or north wind blowing, or when the thermometer stands below 20° F., young children are better off in the nursery. The *hardening* process, in our climate, so far from being successful, usually results in an attack of bronchitis or something worse, which may house the child for a long time, and thus deprive him of the advantage of subsequent favorable weather.

How shall the baby be taken out? The answer to this question involves the consideration of two points, namely, the clothing and the means of conveyance. The former has already been referred to.

As to the method of conveyance, the arm is to be preferred for very young infants, especially in cold weather, because they are apt to be uncomfortable in a coach, and because as they must, when carried, be held close to the nurse's body, they are kept warm by the heat given off from the bearer.

After the fourth month a carriage may be used. Now there are good and bad baby carriages, as well as a right

and a wrong way of trundling them; and here again the mother must not forget that the baby is a tender creature and very easily hurt.

The best kind of carriage is none too good for the load it is destined to carry. It should run smoothly, without jolt or jar; its wheels should be kept from creaking by the frequent application of some mineral oil, as "machine" or "sewing-machine oil;" the bed must be soft and comfortable, lateral support being given to the body by two long, narrow and soft pillows; the infant must never be strapped down, and the parasol must be always at hand, and so arranged as to shade the tender eyes from bright sunlight.

While the carriage is a convenience to the nurse, it is never to be regarded as a place of security for the child, to be left on the sidewalks or in windy places while the wheeler exchanges gossip with fellow-nurses or enters a house to visit friends. However good its springs may be, they are never easy enough to allow of rude jolting or of mounting a raised curbstone by mere dint of hammering and muscle force.

After the age of nine or ten months, a healthy child will begin to creep; at the end of a year he will make efforts to stand, and from four to eight months later will be able to walk by himself. Children, however, present great differences in this respect, and a delay of a few months must not be considered abnormal. Second children are usually more active than those born first, since they imitate and are encouraged by the example of their elders.

So soon as efforts at creeping are made there need be no fear that insufficient exercise will be taken; the care should be, rather, to prevent over-fatigue, as the babe, delighted by its new-found powers, will be inclined to exert them all day long.

So soon as creeping begins, the question arises whether or not the nursery floor is a permissible field for exercise. This depends entirely upon the child's health, the state of the weather and the condition of the nursery. Remember always that the stratum of air next to the floor is much lower in temperature than the middle or upper. In some of the biting days of winter it becomes so cold as to make the feet and legs of an adult uncomfortable, and completely to chill a child, who, in creeping, has his whole body in it for long periods. Therefore, should a child be delicate, should he have either bronchitis or catarrh of the digestive tract, should the weather be very cold, or should the heating of the chamber be imperfect, it is better to keep him off the floor and let him take his exercise on the nurse's bed, which may be stripped down to the mattress for the purpose. Colds are contracted and many more are protracted by playing on the floor in winter.

Many nurses, and some mothers, have an idea that a child should walk at a certain fixed age, and when this time arrives, put into practice various plans for teaching the process. Beware of this, for go-carts, leading-strings, baby-jumpers and all contrivances of this ilk have a tendency to flatten the chest, distort the spine or deform the legs. The proper and only safe plan is to let the child teach himself to walk. This he readily does, first through the act of creeping, in which he exercises every muscle of the body without throwing undue weight upon the soft bones. When by this exercise he has sufficiently strengthened the muscles, he will instinctively seek to do more, first in an effort to get upon the feet, in which, though failure occurs over and over again, he perseveres until successful in standing with support, then without, and finally ends in walking.

The first acquisition of the power of walking should not

be over-taxed, and for a month or more the carriage is the best means of airing; but so soon as sufficient strength is acquired for active exercise—a somewhat variable age—the child should walk out and pass as much time, as the weather and nursery requirements permit, in the open air. Set walks, however, are an abomination to the child as well as to the adult. City-bred children suffer most in this respect, as they are too frequently sent out merely to walk a certain number of blocks, or for a fixed time, and it is no wonder that they quickly tire of such exercise and come to prefer their nurseries to the streets. The only way to avoid this is to give an object to the outing, as, for example, a household errand or the purchase of a cheap toy. In the country, on the other hand, children run about and amuse themselves according to their own pleasure, visit the garden or the farm, and involuntarily take that kind and degree of exercise best calculated to promote the growth and development of their bodies.

Delicate, scrofulous and consumptive children preëminently require pure air and an out-door life, though many of them are too feeble to take sufficient exercise on foot. For such, when the parents' purse allows, a donkey or a pony should be provided. Driving may give sufficient exercise at first; but so soon as enough strength is gained, riding is to be preferred, as it keeps the mind more healthfully occupied, strengthens the muscles, expands the chest and produces a healthy appetite and digestion.

In the earlier years of life the girl and boy play together and take nearly the same sort and amount of exercise. As time goes on, however, and the girl approaches nearer and nearer to maidenhood, she too frequently begins to look upon her brother's game of ball or romping play as too rough, and spends a constantly increasing time indoors

acquiring the manners and the sedentary habits of her elders of the same sex.

This tendency is often encouraged by parents, who prefer polished manners to physical strength, and, above all, dislike their daughters becoming "tom-boys." One must admit that polished manners are a great attraction; but as a woman has more important duties than shining in a drawing-room, they are of little intrinsic value when uncombined with the fine carriage and the good figure which belong only to robust health.

In regard to the carriage and figure, it is useless to try to assist their formation by the aid of braces and corsets. The latter are especially to be condemned, as, unless most cautiously used, they induce undue contraction of the lower part of the chest and displace the solid organs (liver especially) of the abdomen, interfering primarily with respiration and digestion, and secondarily with the general processes of nutrition. The means by which they are secured are: attention to the general health; suitable diet; regulation of the bowels; exercise short of fatigue, and not of particular muscles only, but of the whole frame, and cold bathing and sponging.

My advice, therefore, is to let the girls join in the boys' play. By this plan the latter gain, because they are naturally forced to be more gentle, and the former, because their rapidly-developing frames get the requisite amount of exercise. In addition, let me say, be careful to curb the ambition of the girls to equal the athletic powers of the boys, for their muscular strength is less. Secondly, without letting the subjects know, keep a good lookout upon the general morals; for it is absurd to shut one's eyes to this risk in mingling the sexes in later childhood and youth.

Amusements.—A child's life must be devoted to the cultivation of his mind and his body, an undue development of either resulting in an incomplete manhood or womanhood.

After writing the above sentence I was called from my desk to the bedside of a little sufferer, and on my way met two boys, both about nine years of age, and both patients of mine. The first had a spirituelle face, and spoke to me with a tip of the hat and the grace of a little Chesterfield; but his features were pinched, so it seemed to me, while his face was anxious and his legs were hardly thick enough to carry his body. Nevertheless, his arms were full of books, which, as I had curiosity enough to examine, I found to be a Greek grammar, Cæsar and the elements of algebra. I felt sorry for the overtaxed little brain, and he showed no symptoms of joy at release from school, for he was on his way home to study all his books, to get the teacher's approval and a high mark on the morrow. Scarcely a block away I met my next little friend; his cheeks were rosy, his arms and legs sturdy, and his eyes brimful of health and fun. The burden of books he bore was light, and his teacher probably considered him stupid; but his simple "Halloo, Doctor, I am off for a game of ball this afternoon," and his jolly smile, were more pleasing than all the learning of the first little gentleman.

The lesson taught by these two children is very plain to my mind, and the question which will come out ahead in the long run is easily answered; for health has no handicap in the race of life.

It is right, of course, to let the children study—after the sixth year; but the brain is not to be cultivated at the expense of the body; in other words, they must have plenty of play.

The subject of childish diversion is a broad one, and it is

only possible to outline it here. Let the healthy child play as much as possible in the open air, and let him be as active as he pleases ; for his own sensations will tell him when to stop and when to begin again. The only cautions are not to overlook him too much ; to let him make as much noise as he wishes out of doors and in his own kingdom—the nursery ; to make him play those games which will exercise all the muscles of the body equally, and to guard him, when heated, from drinking ice water or from lying on the cold, damp ground or sitting in a draught. It must be remembered, also, that play is the child's business, so that during convalescence from a debilitating disease it must be regulated according to the strength.

Before closing this chapter a protest must be entered against roller-skates and bicycles ; the first are dangerous to life and limb, and the last, though not so liable to result in broken limbs, produces, from the position it is necessary to assume, a narrowing of the upper portion of the chest.

CHAPTER VI.

SLEEP.

For some time after birth infants spend the intervals between being fed, washed and dressed, in sleep, and thus pass fully eighteen out of the twenty-four hours. As age advances, the amount of sleep required becomes less, until at two years thirteen hours, and at three years eleven hours, are enough. The amount of sleep required will, however, vary considerably in different children, but an observant mother can soon determine this question for herself.

Any marked diminution in the average duration of sleep, or any decided restlessness indicate disease, and demand attention from the physician. At the same time, sleep is, perhaps, more a matter of training than any other item of nursery regimen, and many a mother, by want of judicious firmness, has rendered the early years of her child's life not only a burden to himself, but an annoyance to the entire household.

One cannot too soon begin to form the good habit of regularity in sleeping hours, and so far as circumstances admit, the following rules may be enforced:—

From birth to the end of the sixth or eighth month the infant must sleep from 11 P.M. to 5 A.M., and as many hours during the day as nature demands and the exigencies of the nursery permit. This does not mean that the baby is not to be put to bed until nearly midnight; on the contrary, he should practically settle for the night at six or seven o'clock, but the last feeding should be at eleven o'clock, and after he

must rest undisturbed until the early morning hour, when he should sleep again.

From eight months to the end of two and a half years, a morning nap should be taken, say from 12 M. to 1.30 or 2 P.M., the child being undressed and put to bed. Occasionally an afternoon nap for half an hour or more seems to be necessary, though, as a rule, sleep at night is more undisturbed and refreshing if this be omitted. The night's rest must begin at 7 P.M. If a late meal be required, the child can be taken up at about ten o'clock, but if past the age for this, he may sleep undisturbed until he wakes of his own accord, some time between 6 and 8 A.M. So soon as thoroughly awake the child must be taken up, washed and dressed, and given breakfast. This is the only way to cultivate the habit of early rising, which promotes both bodily and mental welfare, and of all habits is the most conducive to a long and healthy life.

Here again it is necessary to make an explanation. By early rising it is not meant that the child shall be roused from a sound sleep by a rough voice or hand at a certain fixed hour in winter and an earlier one in summer, simply on the whim of a fad-ridden and over-prompt parent. Quite the reverse. Let the child wake of his own accord, for he will do so—whether it be late or early—when he has had enough sleep; at all events, if he must get up at a certain hour—and never fix it before 7 A.M.—make the rousing process as gentle and gradual as possible. Sudden rousing excites the brain, quickens the pulsation of the heart, and, if repeated, may lead to serious consequences.

From two and a half to four years, an hour's sleep may or may not be taken in the morning, according to the disposition and needs of the subject, but in every case the bed must be occupied from seven in the evening to six or seven o'clock on the following morning.

After the fourth or fifth years, few children will sleep in the daytime; they are ready for bed by 8 P.M., and must be allowed to sleep for ten hours or more.

A later retiring hour than 9 P.M. ought never to be encouraged until after the twelfth or fifteenth year. Any postponement of the usual hour for going to bed is injurious, and should abridgment of sleep be accompanied by the excitement of a child's party or the like, the rest obtained is broken and productive of a pale face and nerveless frame on the succeeding day.

The position and general features of the night nursery have already been described, and it only remains to say that when occupied by day it must be darkened so as to favor sound sleeping.

The bed (and where there are several children in the family each should have his own) must be so situated in the room as to be out of the way of draughts. Curtains, while they protect, prevent the access of fresh air, and it is far better to ward off a draught by a movable, folding screen.

The form of bed known as a "crib" may be occupied until the sixth year. The sides must be high, to prevent the child from falling out and injuring himself, and the movable side should work upon hinges rather than move up and down in slots.

Springs and a soft horsehair mattress, protected by a gum cloth, placed under a double sheet, constitute the bed proper, under ordinary circumstances. Sometimes a feather mattress is admissible, but this is only when the child is feeble, and requires artificial aid to keep up the normal body-heat during sleep.

The objection to feathers is, that the body, sinking deeply in, is completely enveloped and subjected to an undue degree

of heat, which relaxes and weakens the system and renders it very susceptible to the injurious influences of cold.

The bed-covering is composed of a sheet, one or more blankets—according to the weather—and a spread. These must be warm enough to maintain a healthy temperature, but, at the same time, not so heavy as to oppress the child.

Especial care should be taken not to cover the nose or mouth, and it is much better to keep the air of the nursery at a proper, even temperature by an open fire than to secure warmth to the body alone by weighty bed-coverings.

The pillow ought to be small, rather thin than the reverse, and made, except for very young infants, of soft horsehair.

A bed should never be made up directly upon the child's leaving it, for then it is saturated with the nocturnal exhalations from the body. So soon as vacated the bed-coverings must be thrown over the backs of chairs, the mattress shaken up, and, the windows of the chamber being thrown open, allowed to air for an hour or more.

In the matter of bed-clothing, cleanliness is as important as in body-clothing, and the nurse must never neglect to re-make a bed if the sheets become wet with urine or otherwise soiled, no matter at what hour of the night the accident may occur. Much trouble in this direction may be avoided, however, by regularly taking up the child at the time of the last feeding and encouraging a thorough evacuation of the bladder.

Besides having separate beds, children should never sleep in the same room with persons who are ill, whether the disease be acute or chronic. Sleeping with those having a long-standing cough or consumption of the lungs is especially to be avoided. Do not get the baby into the habit of being rocked or walked to sleep, and do not allow older children to sleep too soon after a meal, as the processes of

digestion are apt to produce restlessness and uneasiness. Again, a bright light or conversation in the bedroom is never to be permitted after the children have settled to rest.

Finally, teach the nurse to make up the bed neatly and smoothly, and direct her to turn the pillow and smooth out the sheets, should her charge be restless at night. By this latter procedure sound sleep is often brought to a fretful child.

CHAPTER VII.

BATHING.

A well-known English writer states, that "water to the body—to the whole body—is a necessity of life, of health, and of happiness; it wards off disease, it braces the nerves, it hardens the frame, it is the finest tonic in the world."

On the word "tonic" the whole subject hinges. Every one knows that food, even in such a simple form as milk, may be given to excess, with the production of illness, and that medicines are yet more easily abused. Why, then, if the bath be a *tonic* agent, may it not be often used injudiciously and to the detriment of the child?

Intelligent nurses who have grown gray in service, often say that they have seen babies "washed into heaven." This act has never been actually accomplished in my experience, but it has been often enough approached to justify introducing this chapter with the caution that, should the infant be ailing, the bath had better be discontinued until the physician can be consulted. This, of course, does not preclude ordinary cleanliness, for every part of the child's body liable to become soiled can be readily cleaned by the use of a moist sponge, with or without soap, and without bringing into play any of the medicinal or, in other words, tonic effects of the bath.

The initial bath is to be given as soon after birth as the nurse, having made the mother comfortable, can turn her attention to the child. This bath differs somewhat from those that succeed it during infancy, in the fact that it involves a special procedure, namely, the removal of the

tenacious, paste-like material which usually adheres to the skin of the newly-born.

This substance, the *vernix caseosa*, is a fatty varnish or deposit secreted by the glands of the skin. While the foetus is in the womb, it probably acts as a protecting agent, but if allowed to remain long after delivery, it becomes dry and hard, and, in addition to impeding the healthy activity of the skin, leads to excoriations or various eruptions.

To remove it, the whole surface must be first gently, though thoroughly, rubbed with a bit of flannel smeared with fresh lard or olive oil; next, the softened and greasy coating is washed off by a sponge with warm water and soap, and finally the bath is completed by immersing the body in warm water for one or two minutes.

After this preliminary cleansing, one bath a day should be the rule until the completion of the third year of life.

The monthly nurse must bathe the child while she remains in attendance; afterward the mother is the proper person, unless the nurse-maid be exceptionally careful and experienced; and even in this event the mother should superintend the process.

A tub with a supply of water, a piece of soft flannel for a wash rag, a fine sponge, a bit of good soap and several soft towels are the necessary utensils. A long apron made of soft flannel is also a useful article, and it is well to provide a low chair and a bit of oilcloth to place on the floor underneath the tub—the former to enable the bather to get more on a level with her work and make a deeper lap for the child to rest in, and the latter to receive any water that may be splashed about.

An ordinary, oblong tin tub, painted white inside and large enough to give plenty of room is to be preferred to either a porcelain basin or a wooden tub. When in use,

the tub should be placed on the floor, for the sake of firm support, and afterward must be well cleaned, dried and aired.

Water for the bath ought to be pure and *soft*, and should it be muddy or otherwise foul, the nurse must take the trouble to filter it. The character of *softness* is an important one, and when it is impossible to obtain anything but *hard* water from the ordinary sources of supply, a special provision ought to be made for the collection of rain water. The quantity used at a time should be sufficient to cover the child up to the neck when placed in the tub in a semi-reclining position.

A matter of great importance is the temperature of the water. Some—fortunately very few—people use cold water from the first, under the impression that it is strengthening. So far from this being the case, cold water, instead of “hardening,” depresses the vital forces and frequently produces conjunctivitis, nasal catarrh and inflammation of the lungs and bowels.

While cold baths are not to be recommended, one must not go to the other extreme, and use too hot water; for this also weakens the frame and renders it more susceptible to the attack of disease.

Ninety-five degrees Fahrenheit in winter and from eighty-five to ninety-two degrees in summer is the proper temperature. As the heat of water cannot be estimated by the hand with any degree of accuracy, it is essential to use a bath thermometer. See Fig. 13.

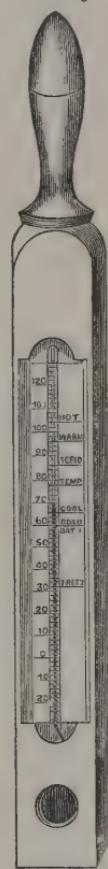
Place this instrument in the water and allow it to remain a few moments, so as to get a full effect upon the mercury; then, should the water be too hot, it may be readily cooled by the addition of cold water, or, if too low in temperature, as easily raised to the proper degree by pouring in hot water.

It is impossible to insist too strongly upon the necessity of uniformly using the bath thermometer. Several times in my experience a tin bath tub has been filled with water so hot that its sides burned the delicate skin of the little hand placed upon it; fortunately, in such instances, the consequent screams led to careful investigation, and no serious damage resulted. On the other hand, I have felt the water cold enough to pain the fingers. Don't neglect the thermometer, then!

A piece of flannel is very useful for the first part of the bathing. It readily takes soap, and, being soft, can be thoroughly rubbed over the skin without danger of injury. A large, soft sponge, however, is best suited to the finishing of the bath, for it holds much more water than a flannel wash rag, and enables the bather to stream the water over the child's body, and thus get the stimulating effect of a miniature shower bath at the same time that the dirt and superfluous soap are washed away from the surface. The wash rag and sponge must, by the way, be the child's exclusive property, and are not to be used twice in succession without being thoroughly cleaned and dried in the open air.

Unscented Castile or glycerine soaps are the best to use. Common soaps are irritating to the skin, and even the purest and most bland articles must be employed with care, that is, neither too frequently nor too profusely, lest they lead to eczema or other cutaneous disorder. When any skin disease is present, the physician's advice must be had not only as to the use of soap, but also in reference to the propriety of the bath itself.

FIG. 13.



Two towels are required for each bath. These should be large and composed of fine, soft material. They must be dry and warm, and perfectly clean, before they are applied to the surface of the child.

The bath apron is made of soft, white flannel, and should be long enough to extend from the neck to the feet of the bather and broad enough to cover the whole front of her gown. Of such a size and shape it serves two purposes; first, a protection to the nurse's clothing, and secondly, a dry and warm covering in which to receive and wrap the child when removed from the water. After the bath the apron, being more or less wet, must be taken off and thoroughly dried. Several such articles should be provided, as they must be frequently washed to keep them clean and free from odors.

Any low chair will do to use in bathing, though, as those usually sold in the shops have not a sufficiently broad seat to give a comfortable support, it is better to make one by sawing off the legs of an ordinary wooden kitchen chair.

The bath must be given at a regular time each day. The two best hours are in the morning, midway between two feedings, at ten o'clock, for instance, and in the evening, just before the infant gets his last bottle and goes to bed. The first is perhaps the better hour, but regularity is the greater point.

At the hour selected, place the tub containing the water, heated to a proper temperature, in a warm and sheltered part of the room, and around it arrange, within convenient reach of the hand, the various requisites of the bath.

Upon undressing the child, wet his head first; then let the head and shoulders rest on the left forearm and lower the child gently into the water, that his body may be covered as far as his neck. Take a wetted and soaped flannel wash

rag in the right hand, and pass it rapidly but thoroughly over the body, avoiding the eyes. Pay particular attention to the arm-pits, to the region between the folds of the buttocks and to the groins. This done, take a large, well-filled sponge in the right hand and squeeze the contents over the body. The chief force of this miniature douche must fall upon the back and loins, and the child, during the operation, must be lifted clear of the bath-water by the left arm and hand.

The sponge is used simply to clear off the dirt loosened by the wash rag, and to remove all superfluous soap; therefore, so soon as this is accomplished, the child should be lifted from the tub to the lap and enveloped in a towel, or better still in the loose folds of a bathing apron. The drying process now begins and consists in *absorbing* the moisture from the skin. This is done by a series of very gentle patting movements with a towel folded over the palm of the hand. In drying a baby, especial attention must be given to the ears and to those portions of the body where the natural folds give rise to crevices in which water may lodge. Unless these parts be thoroughly dried, serious consequences may ensue. Water allowed to remain in the ears may lead to ear-ache and abscesses, and in extreme, though not rare cases, to deafness. If it be retained in a normal crevice—the fold of the buttocks or behind the ears—it causes in a short time troublesome excoriation.

After the infant is patted perfectly dry, the whole surface, but especially the region on each side of the spine, should be rubbed with the naked palm until the skin becomes slightly red. This modified massage ends the bath, and the child, enveloped in a light blanket, may be either placed in his crib to sleep or kept in the lap for ten or fifteen minutes until thoroughly warmed and rested, and then dressed.

Several important points yet remain to be mentioned. The time of actual immersion in water must never exceed five minutes; the body must never be suddenly or rudely plunged into the water; the drying process must never be one of rude rubbing with the towel; a bath must never be given immediately after a meal, nor when the child is either cold or very hot, and the face and head must never be allowed to dip beneath the surface of the water.

Should the latter happen, the child will become so frightened that it will be difficult to get him to enter the water again; and here, by the way, it may be well to state that if there be repugnance to the bath, the tub may be covered over with a blanket, and the child being placed upon it, may be slowly lowered into the water without seeing anything to excite his fears.

The question of the propriety of using powder after a bath is often asked by mothers. Powdering has always seemed to me to be a lazy way of absorbing moisture that should be taken up by a dry towel, and unless there be some excoriation or other indication for its use, the skin can be kept cleaner and healthier without it. In cases, too, in which some disorder of the skin would seem to warrant its employment, much better and quicker results are ordinarily obtained by the application of cold cream, oxide of zinc ointment or vaseline.

The rule of one bath a day may be exceeded in very hot weather, when, in addition to the morning full bath, the body may be sponged twice daily with water at a temperature of 90° F. This, contrary to what might be expected, has a greater and more permanently cooling effect than bathing with cold water.

From what has been written, one might suppose that the details of an infant's bath are endless; so they must seem

when given in full. A skillful bather, however, ought to fulfill every requisite and complete the bath in a period of time not exceeding twenty minutes at the very outside, and this must include not only the actual five minutes' immersion, but the preparation of the bath and the drying process.

After the third year three full baths a week are quite sufficient. An evening hour is now to be preferred, but the water must still be heated to 90° F. in winter, though it may be cooler in the heat of summer. While, at this age, the child has his three full baths weekly, for the purpose of securing absolute cleanliness, he must be sponged every day with water, cool or warmed according to the season.

The sponge bath is best given in the morning, soon after the child has roused himself from sleep and before any food is given. The nurse, for this, must provide herself with a large basin containing water at a temperature of 75° in summer and 85° in winter, a large, fine sponge and several towels. The bath-apron being donned and the child's night-clothes removed, the sponge filled with water is passed rapidly over the whole surface of the body; then the child must be wrapped up in the apron and the skin first dried gently with a soft towel and then rubbed into redness with the open hand. When this process is completed—and it should be done in at least ten minutes—the clothing is put on rapidly, and the child is ready and usually hungry for his morning meal. No soap need be used in these baths.

In the tri-weekly cleansing bath the process of washing is much the same as in infancy. That is, the bath tub being filled with water at a temperature of about 90°, the child is put into it up to his neck and thoroughly soaped with a wash rag, and next doused clean with a large sponge. Here, also, the head must be wet first; the body immersion must not last longer than five minutes; the drying must be

done quickly and with a patting rather than a rubbing movement, and ample reaction of the skin must be secured by gently rubbing with the palm of the hand, especially over the spine.

The washing of the head is a most important matter, as it cleanses the scalp and prevents the formation of scurf, and adds beauty to the hair. At the same time the nurse must be careful how she dries the hair. To rub it gently with a soft towel and then brush it out with a fine hair brush is the proper plan. Combing, in so far as it means dressing the hair and cleansing the scalp with a fine comb, must never be allowed, as it not only thins the hair by pulling it out by the roots, but also irritates the skin and produces eruptions upon it.

As the child approaches puberty he must gradually be taught to wash himself, and should be encouraged to form the habit of bathing every day. The bath at this age should be a sponging rather than a soaking process ; it is best taken in the morning directly after rising, and the temperature of the water may range from 65° to 75° , though delicate children may require it warmer, especially during winter weather.

When childhood merges into youth, while the sponge bath is still preferable to the plunge, water may be used, all the year round, just as it flows from the faucet. The temperature will be, of course, quite low at times, but so long as the bath is taken in a warm room, completed quickly, and followed by a sense of stimulation and warmth, nothing but good results.

Whatever room be used for the purpose of the toilet, the child, if he be old enough to bathe himself, should occupy it alone, so that the whole body may be stripped naked ; otherwise washing cannot be thoroughly or effectually

accomplished. The paraphernalia required are: a large basin, a tin chamber tub or the ordinary fixed bath tub; a piece of coarse flannel, one yard long and half a yard wide; a large sponge; a tablet of soap; a soft towel and a Turkish bath towel.

Having drawn a sufficient quantity of water—two-thirds of the basinful, or two or three inches in either of the tubs—the successive steps of the bath are as follows: wash the hands with soap; dip the head and face into the water; re-soap the hands and rub and wash the head, face, neck, chest, and arm-pits; take the wetted sponge and go all over the parts previously covered by the soaped hands; fold the flannel into a long band, dip it into the water, and, holding an end in either hand, throw it over the shoulders, and move it several times from side to side, then up and down, and then across the back and loins; dip the sponge into water again, and holding the head and shoulders over the tub, stream the water once or twice over the head, neck and face; step into the bath, re-soap the hands and pass them quickly up and down the legs and over the feet. Fill the sponge and squeeze its contents over each leg; finally, sit down and with soaped hands wash the region between the buttocks, removing the suds by a few splashes of water. Next, step from the tub and dry the body quickly, taking care to remove all the moisture from the ears, from between the toes and from the different folds of the body. The drying is to be accomplished by brisk rubbing, first with the soft towel and then with the Turkish towel. The back and loins are the most difficult to reach, but if the towel be thrown over the shoulders, as one would a skipping rope, and moved from side to side several times, the drying of these out-of-the-way parts is accomplished without trouble.

A boy should wash his head as above described each morning; a girl, who has long hair, at least once a week.

Any loitering over the bath is attended with the danger of chilling. Never occupy more time than fifteen minutes in the whole process.

These daily sponge baths are ordinarily quite sufficient to keep the person perfectly clean; sometimes, however, it is necessary to take, in addition, a full, warm bath at intervals of a week. These baths are relaxing if too prolonged; ten minutes is the maximum time for remaining in the water. After leaving the tub there must be no exposure to draughts. The best hour for such a bath is in the evening; some time after the last meal and just before going to bed.

Sea-water baths are useful for a child of any age, although ordinary sea bathing is not to be recommended until the child is old enough and strong enough to hold his own in a moderate surf—after the eighth year, for instance. A younger subject may, when at the seaside, be dressed daily in a bathing suit and allowed to splash for a time in salt-water pools left by a receding tide, or at the edge of the surf. The process of carrying the child into the waves and the immersion of his head, as is often done, is cruel and productive of so much terror that more harm than good results.

In our climate, the proper season for sea bathing is the summer and early fall: from the middle of June until the first of October.

On arriving at the coast, it is always well to prepare for the plunge in the sea by giving, on the first day, a warm salt-water bath. On the day following, about three hours after breakfast, the child may don his bathing dress. Immediately on entering the water, the head must be thoroughly wetted. After this, the bath may be protracted for fifteen, or at most twenty, minutes. To get the invigorating effects

of a surf bath, it should never be repeated oftener than once a day, and in some cases it is better to allow a day to intervene, or even to enter the water only twice a week. Drying and dressing should be rapidly performed, and a half-hour's brisk walk is very useful in promoting reaction and causing free circulation of the blood. Should the bather feel faint after coming out of the water, he must be wrapped in towels and given half a tumblerful of milk containing one or more teaspoonfuls of brandy or whisky.

When the child is either cold or perspiring freely, the bath must not be undertaken.

The bathing suit should be of light flannel, made in one piece like a pair of moderately loose night drawers, but with short arms and legs; it should open only over the shoulders, where, when put on, it is fastened by buttons. This arrangement permits of easy removal after the bath when the flannel is saturated with sea water, and is, in consequence, heavy and sticky.

The question of sea bathing suggests that of swimming. Boys, and girls, also, should learn to swim early. The art is not only a safeguard, but a means of most pleasant and invigorating exercise. It develops the muscles, expands the chest, aids digestion, strengthens the whole frame, and promotes energy, courage and self-reliance.

Swimming, like every other exercise, must be taken in moderation. Even with this care it is not always beneficial. The bather should leave the water experiencing a pleasant glow over the whole surface of the body; the spirits and appetite should be increased, and there ought to be a sensation of augmented strength. If, on the contrary, it should disagree, there is a sense of chilliness, with lassitude and depression of spirits; the face is pinched and pale, and the lips and finger nails are apt to look blue.

Swimming in salt water is more invigorating than in fresh. Apart from the different quality of the two waters, the battling with the waves in the former case is more exhilarating, and the sea breezes, blowing upon the body, carry with them health and strength. Every one must have noticed the increased softness and beauty of the skin and the greater lustre of the hair after a sojourn at the seaside.

It may be serviceable next briefly to detail the different baths in common use, with some reference to their effects upon the system.

Concerning temperature, the bath may be:—

1. Cold, temperature 50° to 65° F.
2. Cool, " 65° to 75° "
3. Temperate, " 75° to 85° "
4. Tepid, " 85° to 92° "
5. Warm, " 92° to 98° "
6. Hot, " 98° to 112° "

When giving a *cold bath*, strip the child in a warm room, and rub him thoroughly with the palm of the hand until the whole body, especially the spinal region, is warm. Let him then stand in a tub containing enough hot water to cover the feet, and sponge him rapidly with the cold water. The temperature of the latter must never be below 60° F., and the addition of half an ounce of rock salt or a tablespoonful of concentrated sea water to the gallon, renders it more stimulating and insures a complete reaction. After sponging, the surface must be thoroughly and quickly dried with a soft towel and shampooed with the open hand until aglow.

This bath, provided the degree of cold does not exceed the resisting powers of the child, is a powerful tonic, producing rapid tissue changes and increasing nutrition. Should the water be too cold, or the sponging continued too long, reaction does not follow the primary shock, and the

result is fatigue, exhaustion, or even dangerous prostration. This bath, therefore, must be used with caution and only under a physician's advice. The cases in which it is of most service are those in which there is a sluggish circulation with poor appetite and feeble digestion ; in which the nutrition is impaired, as in rickets, and in certain spasmodic nervous disorders.

A *cooled bath* is sometimes prescribed, and may be employed with advantage in conditions attended with very high fever. The child is first immersed in water at 95° , and this is gradually lowered to 70° by the addition of cold water, the process occupying from fifteen to thirty minutes.

Analogous to this bath is the *cold pack*. Fold a sheet in such a way as to be long enough to extend from the child's arm-pits to his feet, and wide enough to encircle completely his body ; dip it in water at 80° and lay it smoothly upon a cot, the mattress of which must be protected by a rubber Mackintosh. When all is in readiness, place the child upon the sheet, and wrap it around his body and legs. A blanket must then be thrown over the sheet and the pack left undisturbed for ten minutes. Then lift the child out quickly and envelop him in a warm blanket and allow him to remain at rest for some little time.

In the absence of the physician, sponging with water, at a temperature of 70° or 80° , is the only safe bath to employ to reduce temperature. In giving this bath, strip the child and place him in bed between blankets, while the nurse, inserting her hand between, must pass a damp sponge slowly over the surface. Five to ten minutes may be consumed in this operation, though, if the child complain of chilliness, discontinue the sponging at once ; a sensation of cold, too, indicates the use of warmer water. The operation may be repeated several times daily, or as often as every two hours

in urgent cases, and when the heat reduction is of short duration.

The *hot bath*, 95° to 100° , is employed for various purposes—to relieve nervous irritability, to promote sleep, to produce sweating, and to draw the blood to the surface in the event of congestion of some internal organ. Whether a full bath or merely a foot bath be required, five minutes is sufficient time for immersion; then, with or without drying, according to the degree of sweating desired, the whole body, or only the feet and legs in case of a foot bath, must be enveloped in a blanket, and the child put to bed. To render these baths more stimulating, a teaspoonful to a tablespoonful of mustard flour may be added, and the child held in the water until the *arms* of the nurse begin to tingle. The hot bath is purely stimulating, and it is important not to continue it too long, lest the primary and only desirable effect be followed by depression.

The *blanket bath* is useful in producing perspiration. Wring a blanket out of hot water and wrap it around the child; then throw three or four dry blankets over him and leave him for half an hour; rub the body then with a soft towel, to absorb the moisture thoroughly, and keep the child in bed.

There are several medicated baths in frequent domestic use, which it may be useful to describe.

Mustard Bath.—Take from two teaspoonfuls to two tablespoonfuls of mustard flour; hot water, two to four gallons.

In form of foot bath it produces sweating and determines the blood to the surface. As a general bath it acts as a powerful stimulant.

Salt-water Bath.—Take four tablespoonfuls of rock salt, or Ditman's sea salt, or concentrated sea water; water, hot or cool, according to season, four gallons.

To be used as a general bath every morning in chronic tuberculosis, scrofula, rickets, and general debility. Bath to be followed by thorough rubbing of the surface, especially over the spine.

Bran Bath.—Take one pint of bran; tie up in a muslin bag, place in a quart of water, boil for an hour, squeeze bag thoroughly into the water, and add to four gallons of warm water.

Useful in eczema and other skin diseases.

Soda Bath.—Take one tablespoonful of bicarbonate of sodium; warm water, four gallons.

Used in skin affections.

Compresses are often useful. The wet compress consists simply of a roll of flannel or soft linen dipped in cold water and wrung out, and then applied to the part indicated. Cover this with a piece of oiled silk rather larger than the compress.

There are several matters that bear a more or less close relation to the subject of bathing. These are the care of the teeth, nails and hair.

The teeth must be cleaned morning and evening, and the cleansing process must be begun with the appearance of the first tooth. Ordinarily, a soft wash rag folded over the forefinger, dipped in cool water and thoroughly rubbed over the teeth, is sufficient to keep the early teeth clean, and does not injure the tender gums. Should a dark-colored scum form at the junction of the tooth and gum, a little prepared chalk or other bland tooth-powder may be used in addition. If it be impossible to get at the point of discoloration in this way, shape with a penknife a moderately hard bit of wood into the form shown in Fig. 14, then either bite or rub the woody fibres at the extreme end into a sort of bunch, wet this, dip it in the tooth-powder

and gently rub at the discoloration until it disappears, taking care not to make the gum bleed. Over a piece of wood so shaped one may also wrap a bit of soft cambric and use water and powder as before.

FIG. 14.

STICK FOR
CLEANING
TEETH.

Take good care of the milk teeth, for if they become decayed and broken off or lost, their permanent substitutes are apt to come in irregularly and produce a lasting deformity.

The tooth brush can be used after a number of the milk teeth have been cut. The bristles should be very soft and fine, and it must be employed with gentleness. Unless there be some discoloration, no powder need be used.

The child should early learn to clean his own teeth.

The importance of taking care of the toe nails has already been referred to in the chapter on clothing. The finger nails should not be allowed to grow too long; at the same time it is a bad plan to cut them close to the quick. In trimming them, use a moderately dull pair of scissors, and do not round them too much. When hang-nails appear, they must be cut close with sharp scissors. The fingers and toes should be inspected carefully after each bath, to see if they require attention.

Directions have already been given in regard to washing the hair. All that remains to be said now is to repeat the caution against the use of a fine comb, and to protest against the employment of hair-oil and hair-washes. The best scent for the hair is an occasional dressing of soap and water; the best beautifier, a thoroughly good brushing with two good hair brushes, and the latter should be employed every morning and evening.

Besides keeping the long hair of a girl free from scent and

grease, do not dress it over the ears or tie it up tight and make it "like a cap of iron over the skull."

If the hair be well brushed and the scalp thus sufficiently stimulated, there will be enough natural oil secreted to keep it tidy; artificial oily applications only act temporarily, and by blocking up the pores of the skin tend to make the hair drier and harder to keep in order.

Should there be a tendency for the hair to fall out, wash the scalp thoroughly and frequently with soap and water and stimulate it by firm brushing and the use of a wash such as the following:—

R.	Spt. ammon. aromat.	fʒj.
	Tr. cantharidis	fʒ iss.
	Glycerinæ	fʒ ss.
	Aq. rosæ	fʒ vij. M.

A tablespoonful of this may be rubbed into the scalp once every day, the rubbing to be followed by washing with a sponge and vigorous brushing.

In such cases, however, it is best to seek the advice of a physician, for falling out of the hair may be due to a variety of causes.

CHAPTER VIII.

FOOD.

The choice of food and the method of feeding bear so close a relation to age that it is necessary, in studying these questions, to regard them from the standpoint of the two stages of a child's life mentioned in the first chapter; that is to say, the periods of infancy and childhood.

Infancy.—An infant may be fed in one of three ways: 1st, from the mother's breast; 2d, from the breast of a foster mother or wet-nurse; and 3d, from a bottle, by the method known as artificial or hand-feeding.

1st. *Feeding from the maternal breast.* There can be no doubt that this, being the natural, is at the same time the proper method of nourishing the human infant; and fortunate is the babe that, in our day of advanced civilization and city-living, can draw from the breast of a robust mother an abundant supply of pure, health-giving, tissue-building food.

It follows, therefore, that every woman who is free from certain contra-indicating diseases, to be mentioned later, should nourish her child solely from her breast up to the age of eight months, and partially to the end of the first year, or, failing in either limit, so long as possible.

The infant should be put to the breast as soon as the mother has recovered somewhat from the fatigue of labor—some four or eight hours after birth. Of course no milk can be drawn at this early date, but the babe gets a small quantity of thin, watery fluid, called colostrum, which affords sufficient nourishment, and at the same time, from

its laxative properties, cleans the bowels of the greenish or black, viscid material that collects in the infant's bowels during intra-uterine life. This procedure, too, is of great advantage to the mother, for it insures proper contraction of the womb, draws out the nipples and encourages the formation of milk.

As the secretion of milk is never fully established until the third day after labor, it stands to reason that no food other than the colostrum is required before that time. Hence, the practice of filling the infant's stomach with gruel, sugar and water, and other sweetened mixtures, is more than useless, for it diminishes the activity of sucking and the consequent stimulation of milk production. Put the child to the breast every two hours while the mother is awake, and there need be no fear of starvation.

After the third day, should the breasts not yield a supply of milk, a little sound cow's milk diluted with double its quantity of water and sweetened with sugar of milk, may be given every fourth hour, the babe being put to the breast in the meanwhile. So soon as the flow begins, however, this artificial feeding is to be discontinued.

Usually on the fourth day milk is secreted and regular lactation commences. Many untrained mothers make a failure of nursing because they know nothing of the manner of giving suck; of the length of time the child should be kept at the breast; of the proper time for, and interval between, feeding, and of the importance of regularity. Upon these points the physician must be able, if required, to give minute instructions.

When giving the breast, the infant must be held partly on its side, on the right or left arm, according to the gland about to be drawn, while the mother must bend her body forward so that the nipple may fall easily into the child's

mouth, and steady the breast with the first and second finger of the disengaged hand, placed above and below the nipple. In case the milk run too freely—a condition very apt to excite vomiting—the flow is easily regulated by gentle pressure with the supporting fingers. Each of the breasts should be drawn alternately, the contents of one being sufficient for a meal; and a healthy child may be allowed to nurse until satisfied, when he will stop of his own accord, drop the nipple and fall asleep with milk still flowing over his lips.

During the first six weeks the breast is required every second hour, from 5 A.M. until 11 P.M. At night the infant should be put in a crib by the mother's bed, or, better still, in the nurse's room, and there remain quietly until the morning feeding. This secures the mother six hours of uninterrupted repose, a matter of great importance to her general health and consequent capacity for prolonged lactation. As to the infant, he may rebel at first, and wake and cry, so that it is necessary to quiet him with a little milk and water administered from a bottle; but often after a few days, and certainly at the end of a week or two, the good custom of sleeping at night is formed, and there is no further trouble.

Regularity in meal hours is even of more importance in early than in adult life, on account of the natural feebleness of digestion. To secure this, it is only necessary to have a little perseverance, for infants are such creatures of habit that a short training brings them into the way of expecting food only at certain times, and, when healthy, they wake to suck the breast with almost the precision of the clock. While insisting upon this rule, one must recognize the fact that, although in the vast majority of instances a two-hours' interval is most suitable up to the second month, there is no

absolute law as to the number of daily nursings. Some infants seem to need food less frequently, and it is best to respect their peculiarity and not force the breast upon them so long as they sleep well, do not fret when awake, and thrive generally. Others, again, may require it oftener, every hour and a half, perhaps, and once or twice at night. In these exceptional cases an appropriate schedule can only be made by close observation of individual characteristics.

A common and most ruinous mistake is to resort to constant feeding as a means of pacifying crying. Babies certainly do cry from hunger, but just as frequently the crying results from colic, or from the discomfort and pain of indigestion. Every mother should be able to recognize the difference. The cry from hunger usually begins after a sound sleep, is not peevish, and stops at the sight of the breast, when the infant rouses himself, presents an expression of pleasure, clinches his hands and flexes his limbs. The cry of colic is violent and paroxysmal; the face is livid and wears an expression of suffering; the abdomen is distended and hard; the hands and feet are cold; the legs are drawn up or kicked violently about; and an explosion of wind from the mouth or bowels ends the attack. A peevish cry, hot skin and sour breath attend indigestion.

It stands without saying that the cry of hunger must be relieved by giving food; but this is the very worst thing to do under other circumstances, for it both breaks up good habits and produces serious mischief. The pain of colic and the discomfort of indigestion are chiefly due to the accumulation of flatus resulting from the fermentation of food. Mothers soon learn, and unfortunately infants too, that the breast-milk temporarily relieves suffering. This it does in the same way as any other warm liquid; but, unlike a simple fluid, milk only adds more material to the already

fermenting contents of the gastro-intestinal canal, and every nursing is soon followed by more pain, until between crying and sucking and sucking and crying the infant's life is passed in misery, if not cut short altogether. Instead of continuous feeding, the plan for relief is to decrease the quantity of food by increasing the intervals between nursing and by abridging the time of lying at the breast, while medicines are employed to strike at the root of the evil.

After the sixth week the interval between nursings may be slowly increased until, by the fourth month, it reaches three hours. During this period, also, the time of lying at the breast may be gradually lengthened, for the quantity of milk secreted and the child's appetite and capacity for food are all augmented as the days pass by. At the end of the sixth month, feeding every fourth hour suits some children well, but as a rule the three-hour interval must be adhered to from the fourth month to the end of lactation.

Many authorities recommend additional artificial feeding, alternating with nursing, after the sixth or eighth month. Such a plan is perfectly proper, if the babe cease to gain strength and flesh while on the breast. If otherwise, the maxim of not interfering with any course that is doing well is as applicable here as elsewhere, and the breast may be relied upon entirely until the time comes for weaning.

Should additional nutriment be required, the food must be selected with due reference to age and prepared in the same manner as in regular hand-feeding.

The date of weaning cannot be exactly fixed for all cases, since it must depend upon two conditions,—the health of the mother and the development of the child. When the former continues to be robust and the child steadily grows and gains flesh, lactation can be prolonged until the tenth or twelfth month. If persevered in longer, the mother's

strength begins to fail, her milk is lessened in quantity or becomes poor in quality, the child's nutrition suffers, and he grows pale, thin and flabby, and may develop the disease known as rickets.

Change in the manner of feeding may be accomplished gradually or suddenly. In gradual weaning, about four weeks are required to prepare for the absolute withdrawal of the breast. For instance, if suck be given every three hours, from 5 A. M. until 11 P. M., or seven times a day, there should be, during the first week of preparation, one artificial feeding and six nursings daily; during the second, two and five; during the third, four and three; during the fourth, six and one. Then the breast must be entirely withheld. Carefully prepared milk-food, administered from a bottle, is the best substitute. At the age of ten months a mixture that ordinarily agrees well is:—

R.	Cream	1 tablespoonful.
	Milk	8 tablespoonfuls.
	Sugar of milk	1 teaspoonful.
	Water	3 tablespoonfuls.

This is to be poured into a perfectly clean bottle, warmed in a water bath, and taken through a clean, plain rubber tip. Should the quantity (six fluidounces*) be insufficient to satisfy the child's appetite, all the ingredients except the cream may be increased until the mixture measures eight or even twelve fluidounces, according to the demand.

When such accidents as fever, disordered digestion, with vomiting and diarrhoea, or the actual cutting of one or more teeth occur during the period of preparation, the number of artificial feedings must be reduced, or the breast resumed

* One fluidounce = two tablespoonfuls.

One fluidrachm = one teaspoonful.

until the disturbance be passed; then the course may be begun again and carried to its completion.

Usually there is little trouble in weaning infants in this way. Sometimes they become fretful under the change and may refuse food entirely for a day or more; but a little determination on the part of the mother and the cravings of hunger will soon overcome this difficulty.

Occasionally the child refuses to suck milk from a bottle or to drink it from a cup or spoon, in fact seems to object to any form of liquid food except that drawn from the mother, while at the same time he is eager for bread or other solid food. Under these circumstances prepare for each meal a moderate portion of either rice pudding or junket, both, of course, milk foods. After these have been taken for a day or two, add to each meal a little milk, reducing the amount of pudding or junket; stir the whole together and feed from a spoon; next day still further reduce the solid and increase the liquid, and so proceed until finally a taste for milk is cultivated.

Sudden weaning is not advisable unless, while the breast is being presented, there is an absolute refusal to take artificial food from either a bottle or a spoon. This is most apt to occur when food has been given too frequently, and when the breast has been used as a means to quiet crying. The plan is also to be recommended when the mother's health becomes so affected as to render any further sucking a positive peril to the child's life; rapidly developing tuberculosis of the lungs and attacks of erysipelas or of smallpox are instances in point.

The physician is often forced to decide upon the advisability of premature weaning. His decision must be made cautiously and after thorough investigation of two propositions, namely, *a*, the effect of further lactation upon the

health of the mother, and *b*, the requirements of the child.

a. Lactation being a physiological process is not a drain upon the systemic strength so long as the functions of nutrition are actively performed, but under other circumstances it very frequently becomes so. Consequently, premature weaning is necessary when the mother is attacked by any acute disease threatening dangerous temporary prostration, such as typhoid or typhus fever. A change must also be made if pulmonary tuberculosis be developed, or, being already present, rapidly advances under the drain of milk secretion. Ordinarily, however, the general condition that leads to withdrawal of the breasts is one of simple loss of strength and flesh on the part of the mother.

Undoubtedly these indications often warrant the procedure, but every one who has seen much of children's practice must have met with many cases in which the advice to wean has been given carelessly and unnecessarily, and in which the child might have had its natural food had proper attention been given to the health of the mother.

If a woman be worn out by household cares, if she wear herself out by a round of dinners, balls or shopping, or if she expose herself to injurious atmospheric conditions and eats improper food, she grows weak and thin whether she be nursing or not; and a woman heedless of her health will probably care little whether she suckles her child or gives it up to a wet-nurse or to the bottle.

In addition to making nursing the important duty of her life for the time being, a mother must be as free from house-keeping cares as possible. Mental and physical fatigue is to be avoided, sufficient exercise must be taken to maintain a healthy appetite and digestion, and abundant time devoted to rest and sleep. Beyond securing a plentiful

supply of plain and easily digestible food, with a judicious portion of meat, vegetables, and fruit, it is unnecessary to give special attention to the diet.

Should the secretion of milk be scanty, it may often be increased by the free use of animal broths, chocolate, gruel, or milk, and sometimes the moderate employment of stimulants, in the form of ale and porter, may be necessary. Such tonics as malt extract, ferrated elixir of cinchona, bitter wine of iron, and the preparation known as "beef, wine and iron," are useful when there is anæmia, or when the general failure of strength cannot be overcome by food and attention to hygienic rules.

The ordinary local conditions indicating premature weaning, on the mother's account, are fissures of the nipple and mammary abscess.

Fissure being usually a unilateral condition, it is only necessary to retire the affected side from duty and nourish the child alternately from the unaffected gland and from the bottle until healing takes place, the disabled breast being pumped in the meantime to keep up secretory activity. Should both sides be affected, weaning may be imperative, on account of the extreme pain produced by sucking, though, even under these circumstances, an effort must be made to maintain the flow of milk by regular pumping. Sometimes women are able to struggle through the attack by taking advantage of the relief and protection afforded by a nipple-shield.

Fissures of the nipple are preceded by abrasion, excoriation or erosion having origin in erythema, eczema or ecchymosis. They result, also, from want of cleanliness or from keeping the nipple too moist, as when constant sucking is allowed or when there is a continual flow of milk. They may be prevented by proper attention to the nipple before

confinement. During the latter months of pregnancy the clothing covering the breast must be loose, and the wearing of a wire tea-strainer over the nipple to prevent pressure has been recommended by one authority. Each day, for three months before labor, the nipples should be washed thoroughly with hot water in the morning and anointed with cocoa-butter in the evening. At the same time, should the nipples be small or retracted, the woman must be taught to use her thumb and finger to draw them out. This process is not only an advantage in giving proper size and shape, but brings the skin into good condition without hardening it. The application of alcoholic and astringent solutions are not to be recommended, as they tend to harden the tissue, which should be soft and pliable rather than tanned, this rendering them liable to crack.

When a fissure exists, it is best first to see whether or not nursing can be continued by means of a nipple-shield. Should the child refuse this, a good plan is to fill the shield with warm milk and invert it over the nipple. The infant then draws the fluid at once and without difficulty, and will often continue sucking so that the breast milk follows. After nursing and removing the shield, the nipple must be dried thoroughly with absorbent cotton, and the following lotion applied with a camel's-hair brush :—

R. Acid. boracic. gr. xx.
Mucilag. acaciæ fʒj.

b. On the part of the infant, there are several indications for anticipating the time of withdrawing the mother's breast. It must be done if the occurrence of pregnancy or the recurrence of menstruation render the milk unwholesome ; if the mother contract a dangerous contagious disease, as smallpox, scarlet fever, or erysipelas ; if the mammary glands

become inflamed; if the breast does not afford sufficient nourishment and artificial food be refused; and, finally, if dentition be markedly delayed and the premonitory symptoms of rickets appear. As to the amount of nourishment, it must be remembered that the breast milk may be of good quality, but so diminished in quantity that it is insufficient; or, while abundant in quantity, so poor in quality that it does not meet the demands of nutrition. Even without a minute examination of the milk, it is possible to form a good idea of which condition is present from the behavior of the infant in the act of sucking. If the milk be good in quality but deficient in quantity, the babe, when put to the breast, seizes the nipple as if famished and draws upon it vigorously for a moment or two, and then drops it with a scream of rage. On the contrary, should there be an abundant supply of the poor milk, the nipple is grasped languidly, the child lies a long time at the breast and falls asleep there. Consideration of the final indication opens the question of the propriety of regulating weaning by the progress of dentition. This is certainly a good guide, but not in the way implied in the old precept, that the child must not be taken from the breast until evolution of the stomach and eye teeth. Insufficient food is one of the chief causes of rickets, and rickets more than any other disease delays dentition; consequently, should the teeth not pierce the gum in time, the inference is for other food rather than a continuance of the faulty maternal supply.

Upon deciding to anticipate the time of weaning, the next point to consider is whether the infant shall be brought up by hand or by a wet-nurse.

2d. *Feeding by a wet-nurse.* The advantage of feeding from the breast of a wet-nurse is that the mother's milk is substituted by the milk of another woman; in other words,

that natural feeding is continued—a matter of moment in all cases and of inestimable importance with delicate children. The disadvantage consists in the difficulty of finding, in a woman belonging to the class from which wet-nurses come, all the moral and physical characters essential to a good substitute, and the fact that a stranger is introduced into the household, often to deceive and annoy the family and on the slightest provocation to leave her charge to fate or to the tender mercies of another of her kind. For these reasons it is preferable, in the majority of instances, to trust to careful bottle-feeding. Nevertheless, as some children must have human milk if their lives are to be saved, the rules for selecting a wet-nurse must be understood.

The woman chosen must be strong and robust, but rather spare than fat. Her bill of health must be perfectly free from hereditary tendency to mental or physical disease and from taint of syphilis, consumption or scrofula. She must be cheerful, good-natured, active, careful, and temperate in habits. Her age should be between twenty and thirty years; she should understand the care of an infant and the manner of giving suck; her child ought to be nearly the same age as the infant to be adopted, and she must be able to afford an abundant supply of good milk.

The last quality can be estimated by inspecting the breasts, by examining some of the milk drawn by a pump, and by ascertaining the condition of the woman's own child. The breasts of a good nurse are not necessarily large, but are firm to the touch and pyriform in shape, with well-developed, prominent nipples, and with the skin distinctly marbled with large blue veins. The milk, which ought to flow readily on pressure or on suction, should be opaque and dull white in color, have a specific gravity of 1.031, an alkaline reaction, and show, when placed under the microscope, a number of

minute, equal-sized, fat globules. Its quantity may be ascertained by weighing the child before and after sucking, the normal gain being from three to six ounces. There is, however, no better or more readily applied test of the quality of a nurse than the size, weight, and general development of her child; and if it be weak and ill-nourished, no amount of fitness in other respects can warrant her engagement.

Even when a woman be found fulfilling in her single person all of the above conditions—a rare event, indeed—it does not necessarily follow that her milk will suit the babe to be suckled. Then changes and new trials must be made until the desired end be attained.

The diet of a wet-nurse and the manner of weaning, must be governed by the rules already given for maternal feeding.

Few wet-nurses are employed in Philadelphia, for the simple reason that they are most unsatisfactory. Personally, I have had such good results from carefully regulated bottle-feeding, that I have almost given up the employment of wet-nurses, preferring to regulate the artificial food myself rather than allow an ignorant woman to supplement *sub rosa* her deficient supply of breast milk by an unskillfully proportioned food,—an event of not uncommon occurrence.

3d. *Artificial feeding.* In my experience, there are few American women, especially in the well-to-do classes, who do not look upon the duty of nursing their babies as a pleasant one; but there are many who are completely unable to do so, and a vast number in whom the secretion of milk fails after a few weeks or months of lactation. They must, through no fault of their own, resort to a wet-nurse or to artificial feeding. Usually, they select the last method, with results that vary in direct proportion to the care and intelligence displayed in carrying it out.

There can be no doubt, though the statement is a bold one and seemingly contrary to nature, that, taking the average, infants properly brought up by hand are better developed and enjoy more perfect health than those completely breast-fed. Of course there is no artificial food equal to the natural—the sound breast milk of a robust woman—and a child fed upon this must thrive, if other circumstances be favorable. Unfortunately, the woman who has sufficient health and strength to furnish an abundant supply of good milk during the ten or twelve months of normal lactation is unique in our large cities; and the great bulk of those who do nurse children grow pale, thin and feeble, and give milk which, though sufficient in quantity to fill the suckling's stomach and satisfy the cravings of hunger, does not contain enough pabulum to meet the demands of nutrition. Such mothers always complain that their children are puny, peevish and always ailing, and wonder why their neighbor's babies, fed upon the bottle, are so round, jolly and healthy. The explanation lies in the simple fact that good cows' milk is better than bad breast milk.

Infants can be reared perfectly well upon the bottle, but much more care and trouble are involved than in breast feeding. The task is comparatively easy to accomplish when the powers of digestion are inherently active, and especially when artificial feeding is not required until after the child has been suckled for several weeks. In these cases the stomach and intestinal canal, inactive in foetal life, are trained to their new duties under normal conditions, and so prepared for the digestion of properly selected artificial food. On the contrary, if digestion be naturally feeble, or if the infant must be bottle-fed from the first, great difficulty may be expected, and most skillful handling is necessary.

To insure success in hand-feeding, it must be remembered that an infant is not nourished alone by the food he swallows, but by that portion of it he digests and assimilates. The best diet, therefore, is one so adapted to age and digestive power that everything eaten will be digested and absorbed. But as children differ as much in constitution as in feature, it is impossible to formulate exactly a food that will be applicable to every case, or one that needs no change from month to month of progressing growth. As age and strength increase, there is a corresponding development of the gastro-intestinal functions and a call for more and stronger food. On the other hand, should the system be accidentally reduced by disease, the digestion, sympathizing in the general debility, temporarily loses its normal activity and assumes that of an earlier age. Now, more nourishment is certainly needed to build up the failing strength, but it is to be supplied by giving such food as can be completely assimilated, and not by forcing down strong food merely because it is *strong*; for the latter, when not vomited, passes through the bowels undigested, and the little creature starves to death in the midst of plenty, or dies from the ill effects of the constant presence of fermenting food in the alimentary canal. On these accounts many changes in diet as to quality and quantity must be anticipated and made.

Other important matters to be studied in detail are: *a*, the selection of a proper substitute for the breast milk; *b*, the quantity to be given; *c*, the method of preparation; *d*, the mode of administration; and *e*, the means of preservation.

a. Healthy breast milk must be taken as the type of infants' food, and the nearer an artificial substance can be made to approach it in chemical composition and physical properties, the more perfect is it.

Normal breast milk has a specific gravity of 1.031. It is a persistently alkaline fluid, having a somewhat animal, usually disagreeable, and very rarely sweetish taste. It is bluish-white in color and thin and watery in consistence.

According to Leeds' very thorough analysis, it contains:—

Water	86.766	per cent.
Total solids	13.234	"
Total solids not fat	9.221	"
Fat	4.013	"
Milk sugar	6.997	"
Albuminoids	2.058	"
Ash	0.21	"

It contains, then, nitrogenous material, carbohydrates, salts and water—all the elements essential to repair tissue waste, to supply new material for growth and to maintain body heat, or, in other words, to constitute a perfect aliment; and these, too, are so proportioned in the combination as to most easily and completely meet the demands.

It must not be supposed, however, that the elements are uniformly present in the same proportion. On the contrary, the fluid varies both at different periods of lactation and in different individuals.

This fact is the most striking feature of the above observer's work, which shows that the most changeable constituent is the albumen, varying from a maximum of 4.86 per cent. to a minimum of 0.85; the next are the fats and salts, the maximum being about three times the minimum, and the least the sugar. The latter, in fact, varies but little from a standard of about 7 per cent. The function of albumen is nutritive, that of milk sugar calorifacient; hence the point seems to be that nature, while allowing a wide range of oscillation in the rapidity of tissue building, carefully provides an available fuel for the constant maintenance of

animal heat; the supply of caloric due to cerebral impulses and self-originated locomotion being extremely small in early infancy.

In seeking a substitute for human milk, one naturally turns to the domestic animals for the source of supply. Between the milk of the ass, cow, goat and ewe there is little choice, so far as composition is concerned, though, perhaps, asses' milk resembles that of women a little more closely than the others; nevertheless, cows' milk is usually selected, because, being plentiful, it is easily obtained and cheap.

Cows' milk* (market milk) has a specific gravity of 1.029, is richer looking—that is, whiter and more opaque than human milk, and is slightly acid in reaction unless perfectly fresh from pasture-fed animals, when it may be neutral or alkaline, and contains—

Water	87.7	per cent.
Total solids	12.3	"
Total solids not fat	8.48	"
Fat	3.75	"
Milk sugar	4.42	"
Albuminoids	3.42	"
Ash	0.64	"

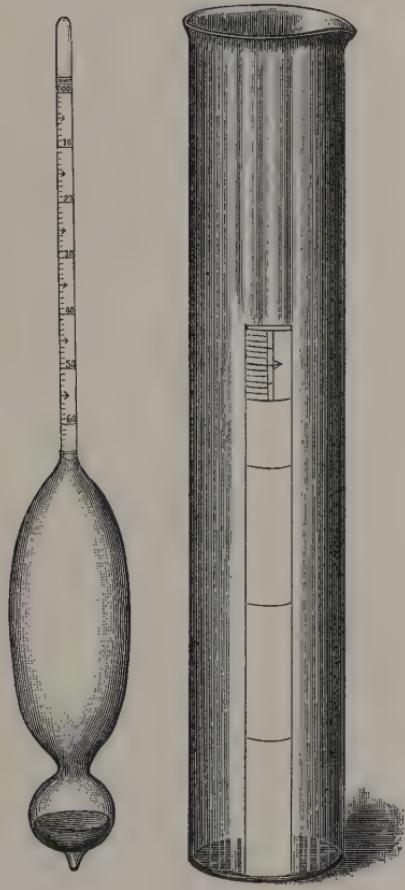
Comparing this analysis with that previously given, it is readily seen that the two fluids differ in specific gravity and

* The characters of cows' milk may be determined with sufficient accuracy in the following way:—

Provide a urinometer, such as shown in the accompanying cut, and which can be obtained at any drug shop. To obtain the specific gravity, fill the beaker to such a point with milk that it will float the specific gravity glass, and read the degree of density from the scale at a level with the surface of the milk. The chemical reaction is found by inserting a piece of blue litmus paper, which should turn slightly red a few moments after being wet. To ascertain the proportion of cream, cut a narrow strip of paper four inches long, and divide the upper half-inch, by cross-markings, into twelve equal parts;

reaction, and that cows' milk contains more nitrogenous material, but less fat and much less sugar than woman's milk.

FIG. 15.



LACTOMETER.

paste this on the beaker with the marked portion uppermost, and the lower edge coming accurately to the bottom of the glass (see Fig. 15); then pour in enough milk to come just to the top of the paper, and place the whole aside for twenty-four hours. During this time the cream rises and appears as a yellow layer at the top; this layer should have the depth of ten or twelve spaces.

The nitrogenous material differs in quality as well as in quantity. König, in a number of analyses that closely correspond with those of Leeds, divides the nitrogenous constituent into three groups; namely, caseine, albumen and albuminoids, basing the division upon the different effects of coagulating agents.

Upon this point Leeds remarks: "Whilst by present modes of analysis the separation of the so-called caseine from the so-called albumen is not accurately performed, yet the results are approximately correct (König's), and have a very great value in pointing out the most important of all the differences between the two secretions, which is, that the fraction of the total albuminoids in cows' milk which is coagulable by acids is far greater (perhaps four times) than the non-coagulable part.

"In woman's milk, on the contrary, the reverse is true, and the non-coagulable part much exceeds (perhaps by more than twice) the coagulable portion."

This difference is readily tested by adding rennet to the two fluids. In the case of cows' milk the caseine is coagulated into large, firm masses, while with human milk a light, loose curd is formed. In the stomach the acid gastric juice has the same effect, producing in the first instance a coagulum most difficult to digest; in the other, one readily attacked and broken down by the gastro-intestinal solvents.

These chemical and physical properties of cows' milk can be altered by various methods of preparation, and unless this be done there are few instances in which it will not prove a poor substitute for the natural food.

Condensed milk is frequently recommended by physicians and largely used by the laity, on their own responsibility. It keeps better than cows' milk and is supposed to be more readily digested by young infants.

The latter supposition is a mistaken one, and arises from the overlooked fact that condensed milk is always given dissolved in a large proportion of water, while cows' milk is too frequently used insufficiently diluted or otherwise improperly prepared. The author is convinced of the accuracy of this statement from a number of years' close study of the subject.

Condensed milk contains a large proportion of sugar, forms fat quickly, and thus makes large babies; sugar also counteracts the tendency to constipation—often a troublesome complaint in hand-feeding. These advantages are unquestioned, and, together with the ease of preparation, are those which place it so high in the esteem of monthly nurses. It is equally true that, as a food, it does not contain enough nutrient material to supply the wants of a growing baby.

Again, more than half of the saccharine ingredient of this preparation is cane sugar, added for the purpose of preservation, and this material is very liable, when in excess, to ferment in the alimentary canal, giving rise to irritant products that impede digestion.

Infants fed upon condensed milk, though fat, are pale, lethargic and flabby; although large, are far from strong; have little power to resist diseases; cut their teeth late, and are very likely to drift into rickets. It must be remembered also that condensed milk, when long kept, or when packed in imperfect cans, not unfrequently undergoes decomposition, and thus becomes utterly unfit for use.

For a temporary change of diet, and as a substitute during traveling or under circumstances in which sound cows' milk cannot be obtained, it may be resorted to with advantage.

The farinaceous substances so often selected, especially by the poor, to replace breast-milk, are not only bad foods, but

have both directly and indirectly a deleterious effect upon the processes of nutrition.

They are bad for two reasons. First, they differ materially in chemical composition from human milk. For example, in arrowroot, which is the favorite, the proportion of the nitrogenous to the calorifacient element is as one to twenty, while in human milk it is about one to five. Secondly, the calorifacient principle, starch, must be converted into sugar before it can be absorbed. This change is accomplished in the body by the saliva and pancreatic juice,—secretions that are not fully established until the fourth month.

While the starch lies undigested in the gastro-intestinal canal, it is subject to fermentation, resulting in the formation of irritant products that rapidly induce catarrh of the mucous membrane, a condition directly interfering with the digestion and absorption of food. Again, perfect nutrition demands rapid waste and removal of effete tissues as well as repair of the same. This is effected by oxidation. Now sugars are known to have a much greater affinity for oxygen than albuminates, and when the diet consists of farinaceous material, the little sugar formed and absorbed appropriates oxygen that would otherwise go toward the removal of waste, and so retards the necessary changes.

Farinaceous food, as such, is never permissible before the fourth month; earlier, it is only to be employed for its mechanical action, as an addition to milk preparations. This will be mentioned later.

The nutrient value of the cereals and their products as they exist in so-called "infants' foods," has been imperfectly determined. They are undoubtedly useful as mechanical attenuants, but it is very questionable whether any of them, unless prepared with milk, can permanently meet the

demands of nutrition. At the same time it is quite probable that the soluble albuminoid substances obtained by Liebig's process have a food value of their own, making them more serviceable than the starches.

b. The quantity of food to be allowed each day varies with the appetite and age. Some infants habitually eat little, others much; as both thrive, the question of the correct amount in a given case must be answered by observation. So long as the child develops with normal rapidity and keeps well, he may be allowed to eat as much or as little as he wants; for, if food of proper strength be given at proper intervals, the instinctive cravings of hunger, since they represent the wants of the system, rarely lead to excess in either direction. Nevertheless it is well to have some guide.

During the first four weeks, infants generally require from twelve and-a-half to sixteen fluidounces of food; in the second and third months, about twenty-four fluidounces, and from this time to the twelfth month from two to two and-a-half or even three pints. After the twelfth month the quantity depends upon whether additions be made to the diet, or milk food be used exclusively. When the daily amount reaches three pints, the limit of the capacity of the stomach is usually attained, and the greater demand for nutriment, as growth advances month by month, must be met by adding to the strength of the food rather than by increasing its bulk. These two factors, strength and quantity, are intimately associated throughout the whole period of infancy, and in the earlier months a mere increase in the latter is not always sufficient to maintain the balance of nutrition.

As a rule, infants are overfed so far as quantity is concerned, and this opens the very interesting question of the

normal capacity of the stomach at different ages. Rotch has recently written an important paper upon the subject. He states that, by actual measurement, the stomach of an infant five days old holds 25 c.c., or six and-a-quarter fluidrachms, a quantity very far short of that usually forced upon the babe during the first week. Frowlowsky's investigations show that there is a very rapid increase in the capacity of the stomach during the first two months of life, while in the third, fourth and fifth months the increase is slight. Guided by these data, the quantity of food should be rapidly augmented during the first six or eight weeks of life, and then held at the same quantity up to the fifth or six month. Another considerable increase is also demanded between the sixth and the tenth months.

While the author has been unable to verify the above measurements, and has, on the contrary, found no uniformity in the size of the stomach for given ages, yet the following table (Rotch) is a useful one, and corresponds closely with conclusions drawn from clinical experience.

GENERAL RULES FOR FEEDING.

Age.	Intervals of Feeding.	Average Amount at Each Feeding.	Average Amount in 24 Hours.
First week.	2 hours.	1 ounce.	10 ounces.
One to six weeks.	2 $\frac{1}{2}$ hours.	1 $\frac{1}{2}$ to 2 ounces.	12 to 16 ounces.
Six to twelve weeks and possibly to fifth or sixth month.	3 hours.	3 to 4 ounces.	18 to 24 ounces.
At six months.	3 hours.	6 ounces.	36 ounces.
At ten months.	3 hours.	8 ounces.	40 ounces.

c. The object to be accomplished in the preparation of cows' milk is to make it resemble human milk as much as possible in chemical composition and physical properties. To do this, it is necessary to reduce the proportion of caseine, to increase the proportion of fat and sugar, and to overcome the tendency of the caseine to coagulate into large, firm masses upon entering the stomach.

Dilution with water is all that need be done to reduce the amount of caseine to the proper level; but as this diminishes the already insufficient fat and sugar, it is essential to add these materials to the mixture of milk and water. Fat is best added in the form of cream, and of the sugars, either pure white loaf sugar or sugar of milk may be used. The latter is greatly preferable, as it is little apt to ferment, and contains some of the salts of milk, which are of nutritive value.

Firm clotting may be prevented by the addition of an alkali or a small quantity of some thickening substance, as barley water, gelatine, or one of the digestible prepared foods.

Lime water is the alkali usually selected. It acts by partially neutralizing the acid of the gastric juice, so that the caseine is coagulated gradually and in small masses, or passes, in great part unchanged, into the intestine to be there digested by the alkaline secretions. As it contains only a half a grain of lime to the fluidounce, the desired result cannot be attained, unless at least a third part of the milk mixture be lime water. The quantity often used—one or two teaspoonfuls to the bottle of food—has no effect beyond neutralizing the natural acidity of the milk itself. When lime water is constantly employed, it becomes quite an item of expense if procured from the drug shop; this outlay is unnecessary, for it can be made quite as well in the nursery. Take a piece of unslaked lime as large as a walnut, drop it

into two quarts of filtered water contained in an earthen vessel, stir thoroughly, allow to settle and use only from the top, replacing the water and stirring as consumed.

Instead of lime water, two to four grains of bicarbonate of sodium may be added to each bottle, or, better still, from five to fifteen drops of the saccharated solution of lime.

This solution is made in the following way:—

Take of—

Slaked lime	1 ounce.
Refined sugar, in powder	2 ounces.
Distilled water	1 pint.

Mix the lime and sugar by trituration in a mortar. Transfer the mixture to a bottle containing the water, and having closed this with a cork, shake it occasionally for a few hours. Finally, separate the clear solution with a siphon and keep it in a stoppered bottle.

Thickening substances—attenuants—act purely mechanically by getting, as it were, between the particles of caseine during coagulation, preventing their running together and forming a large, compact mass.

When an “infant’s food” is used to act mechanically, care should be taken to select one in which the starch has been converted into dextrine and grape sugar by the process of manufacture. The articles known as “Mellin’s Food” and “Horlick’s Food” can be relied upon. One teaspoonful of either dissolved in a tablespoonful of hot water and added to each portion of food, makes a very easily digested mixture.

For the successful management of children, the practitioner must not only be familiar with the theory of feeding, but must be able to write out precise directions for the preparation of the food. To this end a schedule of the diet of an infant from birth upward, with a sketch of the modifications that have to be made most frequently, will serve as a useful guide.

Diet during the first week:—

Cream	2 teaspoonfuls.
Whey	3 teaspoonfuls.
Water (hot)	3 teaspoonfuls.
Milk sugar	$\frac{1}{4}$ teaspoonful.

For each portion; to be given every two hours from 5 A.M. to 11 P.M., and in some cases once or twice at night, amounting to twelve fluidounces of food per diem.

Diet from the second to the sixth week:—

Milk	1 tablespoonful.
Cream	2 teaspoonfuls.
Milk sugar	$\frac{1}{4}$ teaspoonful.
Water	2 tablespoonfuls.

For one portion; to be given every two hours from 5 A.M. to 11 P.M.; amounting to seventeen fluidounces of food per diem.

Diet from the sixth week to the end of the second month:—

Milk	$2\frac{1}{2}$ tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	$\frac{1}{2}$ teaspoonful.
Water	$2\frac{1}{2}$ tablespoonfuls.

For each portion; to be given every two hours, amounting to thirty fluidounces per diem.

Diet from the beginning of the third month to the sixth month:—

Milk	5 tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	1 teaspoonful.
Water	2 tablespoonfuls.

For each portion; to be given every two and a half hours, or thirty-two fluidounces per diem.

Diet during the sixth month; six meals daily from 6 or 7 A.M. to 9 or 10 P.M.

Morning and midday bottles each:—

Milk	9 tablespoonfuls.
Cream	1 tablespoonful.
Mellin's Food	1 teaspoonful.
Hot water	2 tablespoonfuls.

Dissolve the Mellin's Food in the hot water and add, with stirring, to the previously mixed milk and cream.

Other bottles each:—

Milk	9 tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	1 teaspoonful.
Water	2 tablespoonfuls.

This gives an equivalent of thirty-six fluidounces of food in a day.

In the seventh month the Mellin's Food may be increased to two teaspoonfuls and given three times daily.

Throughout the eighth and ninth months five meals a day will be sufficient.

First meal at 7 A. M.:—

Milk	13 tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	1 teaspoonful.
Water	2 tablespoonfuls.

Second meal at 10.30 A. M. Milk, cream and water in the same proportion; Mellin's Food, one tablespoonful.

Third meal at 2 P. M.—Same as second.

Fourth meal at 6 P. M.—Same as second.

Fifth meal at 10 P. M.—Same as first.

This gives forty fluidounces of food per diem.

Instead of Mellin's Food, a teaspoonful of "flour-ball" * may be added.

* See Chap. IX.

Two meals of flour-ball daily—say the second and fourth—are all that can be digested. To prepare these, rub one teaspoonful of the powder with a tablespoonful of milk into a smooth paste, then add a second tablespoonful of milk, constantly rubbing until a cream-like mixture is obtained. This is poured into eight ounces of hot milk, stirring well, and is then ready for use. The other meals should be composed of milk, cream, sugar of milk and water, as already given.

Mellin's Food and flour-ball may be substituted by oatmeal or barley, or any one of the infants' foods in which the starch has been converted, by Liebig's process, into dextrine and grape sugar.

Diet for the tenth and eleventh months:—

First meal, 7 A.M.:—

Milk	17	tablespoonfuls.
Cream	1	tablespoonful.
Mellin's Food	1	tablespoonful.
(Or flour-ball or barley jelly)	2	teaspoonfuls.
Water (Used only with Mellin's Food)	2	tablespoonfuls.

Second meal, 10.30 A.M.—A breakfast-cupful of warm milk (eight fluidounces).

Third meal, 2 P.M.—The yolk of an egg lightly boiled, with stale bread crumbs.

Fourth meal, 6 P.M.—Same as first.

Fifth meal, 10 P.M.—Same as second.

On alternate days the third meal may consist of a tea-cupful (six fluidounces) of beef tea containing a few stale bread crumbs.

A further variation can be made by occasionally using mutton, chicken or veal broth instead of beef tea.*

* See Chap. ix.

As much more difficulty is experienced in feeding infants during the first twelve months than during the second, it would be well to pause here to consider what had best be done in case the food described should disagree.

If, after feeding, vomiting occur, with the expulsion of large, firm clots of caseine, the effect of adding lime water or barley water must be tried.

For instance, at the age of six weeks make each bottle of:—

Milk	2½ tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	½ teaspoonful.
Lime water	2½ tablespoonfuls.

Or of:—

Milk	2½ tablespoonfuls.
Cream	1 tablespoonful.
Milk sugar	½ teaspoonful.
Barley water	2½ tablespoonfuls.

Sometimes, particularly if there be diarrhoea, boiling makes the milk more digestible, and in this condition it may be used instead of fresh milk in either of the above mixtures. Condensed milk, too, can be employed temporarily, making each portion of:—

Condensed milk	1 teaspoonful.
Cream	1 tablespoonful.
Hot water	5 tablespoonfuls.

Should further alteration be necessary, goats' or asses' milk may be substituted for cows' milk, the strong odor of the former and the laxative properties of the latter being removed by boiling. One ass is capable of nourishing three children for the first three months of life, two children for the fourth and fifth months, and one child after this period

to the ninth month. The milk should be used warm from the udder.

“Strippings” is another good substitute for cows’ milk. It is obtained by re-milking the cow after the ordinary daily supply has been drawn, and contains much cream and but little curd. Assimilable proportions of this are:—

Strippings	2 tablespoonfuls.
Water	4 tablespoonfuls.

And if the small amount of caseine in such a mixture be still undigested:—

Strippings	3 tablespoonfuls.
Barley water	3 tablespoonfuls.

Another good food is that recommended by Dr. A. V. Meigs. It consists of a combination of two parts of the cream, containing from fourteen to sixteen per cent. of fat; one part average milk; two parts lime water, and three parts sugar water, the latter consisting of seventeen and three-fourth drachms* of milk sugar to one pint of water. This makes an alkaline mixture with the percentage of its ingredients closely corresponding to human milk.

When, in spite of careful preparation, all of these foods give rise to indigestion with fever, and the expulsion, by vomiting and diarrhoea, of hard curds from the stomach and intestines, the expedient of predigesting the milk must be resorted to. There are several ways of artificially digesting milk.

One plan, recommended by Eustace Smith, is to add to each fluidounce of milk five grains of pure pepsin and four drops of dilute muriatic acid; digest in a water-bath, at a temperature of 100° F., until the mixture becomes clear,

*About eighteen teaspoonfuls.

then neutralize with bicarbonate of sodium, and the milk is ready for use.

Another method is to peptonize the milk by pancreatin.* That manufactured under the name of extractum pancreatis, by Fairchild Brother & Foster, of New York, has proved most efficient in my hands. To accomplish this artificial digestion, put into a clean quart bottle five grains of extractum pancreatis, fifteen grains of bicarbonate of sodium, and four fluidounces of cool, filtered water ; shake thoroughly together, and add a pint of fresh, cool milk. Place the bottle in water, not so hot but that the whole hand can be held in it for a minute without discomfort, and keep the bottle there for exactly thirty minutes. At the end of that time put the bottle on ice to check further digestion and keep the milk from spoiling. The fluid obtained, while somewhat less white in color than milk, does not differ from it in taste ; if, however, an acid be added, the caseine, instead of being coagulated into large, firm curds, takes the form of minute, soft flakes, or readily broken-down feathery masses of small size. When the process is carried just to the point described, the caseine is only partly converted into peptone ; but every succeeding moment of continued warmth lessens the amount of caseine until peptonization is complete. Then the liquid is grayish yellow in color, has a distinctly bitter taste, and shows no coagulation whatever on the addition of an acid. This artificial digestion, therefore, may be carried just as far as circumstances indicate, although it is ordinarily best to stop it short of complete conversion, as children object to the markedly bitter taste, and often, on account of it, absolutely refuse the food. Partial peptonization, too, is usually sufficient to adapt the milk to ready

* The subject of peptonization is further considered in Chapter ix.

assimilation. To seize the proper moment for arresting the process, the person conducting it must be told to taste the milk from time to time, and as soon as the least bitterness is appreciable to remove the bottle from the hot water and place it upon ice for cooling and use. Such milk may be sweetened with sugar of milk, and given pure or diluted with water. For an infant of six weeks each meal may consist of:—

Peptonized milk	6	tablespoonfuls.
Milk sugar	$\frac{1}{2}$	teaspoonful.
Water	2	tablespoonfuls.

To this cream may be added when desirable, and by diminishing the quantity of water and increasing that of milk the strength of the food may be made greater at any time.

Although every precaution be taken, the last of a quantity of predigested food is very apt to grow bitter; and if the attendants will take the trouble, it is much better to peptonize every meal separately. This is readily done by obtaining a number of powders of pancreatin and bicarbonate of sodium, so proportioned that each packet shall contain the proper amount for one bottle of food.

For example:—

R. Ext. pancreatis	gr. ix.
Sodii bicarb	gr. xxiv.
M. et ft. chart. (waxed papers) No. xij.	

S.—Put one powder into a nursing bottle with two fluidounces of filtered water and two fluidounces of fresh sweet milk; shake together and keep warm in a water-bath for about half an hour before feeding; sweeten with half a-teaspoonful of milk sugar.

The great advantages of partial peptonization are that the necessity for lime water, barley water and thickening substances to keep apart the curd is done away with, and

that, when the digestive disturbance requiring a careful preparation of food is removed, an ordinary milk diet can be gradually resumed by regularly diminishing the time artificial digestion is allowed to progress. This changes the caseine in a less and less degree, until, finally, it is taken in its natural form.

Instead of this ordinary peptonizing process, I have for the past year or more employed the "Peptogenic milk powder," prepared by the chemists already referred to. This powder contains a digestive ferment, pancreatin; an alkali, bicarbonate of sodium; and a due proportion of milk sugar.

The mode of employment is as follows:—

Take of—

Milk	4 tablespoonfuls.
Water	4 tablespoonfuls.
Cream	1 tablespoonful.
Peptogenic milk powder	1 measure.*

This mixture is to be heated over a brisk flame to a point that can be comfortably sipped by the preparer (about 115° F.) and kept at this heat for six minutes. When properly prepared, the resultant, so-called "humanized milk," presents the albuminoids in a minutely coagulable and digestible form, has an alkaline reaction, contains the proper proportion of salts, milk sugar and fat, and has the appearance of human milk.

Leeds gives the following analysis of this prepared milk:—

Water	86.2 per cent.
Fat	4.5 "
Milk sugar	7. "
Albuminoids	2. "
Ash (salts)	0.3 "

* Measure provided with each can of powder.

This corresponds very closely with his average analysis of human milk.

In using this powder, too, one can readily return to a plain milk diet by gradually shortening the time of heating; in other words, by slowly diminishing predigestion.

Sometimes milk, in every form and however carefully prepared, ferments soon after being swallowed and excites vomiting, or causes great flatulence and discomfort, while it affords little nourishment. With these cases the best plan is to withhold milk entirely for a time and try some other form of food. The following are good substitutes:—

Mellin's Food	1	teaspoonful.
Hot water	6	tablespoonfuls.

For each portion; to be given every two hours at the age of six weeks.

Veal broth ($\frac{1}{2}$ lb. of meat to the pint) .	3	tablespoonfuls.
Barley water	3	tablespoonfuls.

For one portion.

Whey	3	tablespoonfuls.
Barley water	3	tablespoonfuls.
Milk sugar	$\frac{1}{2}$	teaspoonful.

A teaspoonful of the juice of raw beef* every two hours will usually be retained when everything else is rejected.

Such foods are only to be used temporarily until the tendency to fermentation within the alimentary canal ceases; then milk may be gradually and cautiously resumed.

When infants who are approaching the end of the first year become affected with indigestion, it is often sufficient to reduce the strength and quantity of the food to a point compatible with digestive powers. For instance, at eight

* See Chapter IX.

months the food may be reduced to that proper for a healthy child of six months, or even less. Here, too, predigestion of the food is very serviceable. If a few grains of extractum pancreatis be added to a gobletful of thick, well-boiled starch gruel, at a temperature of 100° F., the gelatinous mucilage quickly grows thinner and soon is transformed into a fluid, the starch having been rendered soluble by the action of the pancreatin; by still longer contact, the hydrated starch is converted into dextrine and sugar. Advantage may be taken of this property to render the foods containing starch assimilable. Thus, to a mixture of barley jelly and milk, *e. g.*—

Barley jelly	2 teaspoonfuls.
Milk sugar	1 teaspoonful.
Warm milk	16 tablespoonfuls.

add three grains of extractum pancreatis, and five grains of bicarbonate of sodium, and keep warm for half an hour before administering.

The same process may be employed with food containing oatmeal, arrowroot or wheaten flour, with the effect of converting the starchy ingredients into digestible elements without materially altering the taste.

When the infant has arrived at an age to take meat broths, these too may be readily peptonized when digestion is enfeebled.*

Returning to the regimen of the healthy infant, it will be found that after the first year far less change is required in the food from month to month.

Diet from the twelfth to the eighteenth month, five meals per day:—

* See Chap. ix.

First meal, 7 A.M.—A slice of stale bread, broken and soaked in a breakfast-cup (eight fluidounces) of new milk.

Second meal, 10 A.M.—A teacup of milk (six fluidounces) with a soda biscuit or thin slice of buttered bread.

Third meal, 2 P.M.—A teacup of beef tea (six fluidounces) with a slice of bread. One good tablespoonful of rice-and-milk pudding.

Fourth meal, 6 P.M.—Same as first.

Fifth meal, 10 P.M.—One tablespoonful of Mellin's Food with a breakfast-cupful of milk.

To alternate with this:—

First meal, 7 A.M.—The yolk of an egg lightly boiled, with bread crumbs; a teacupful of new milk.

Second meal, 10 A.M.—A teacupful of milk with a thin slice of buttered bread.

Third meal, 2 P.M.—A mashed, boiled potato, moistened with four tablespoonfuls of beef tea; two good tablespoonfuls of junket.

Fourth meal, 6 P.M.—A breakfast-cupful of new milk with a slice of bread broken up and soaked in it.

Fifth meal, 10 P.M.—Same as second.

The fifth meal is often unnecessary, and sleep should never be disturbed for it; at the same time, should the child awake an hour or more before the first meal, he must break his fast upon a cup of warm milk, and not be allowed to go hungry until the set breakfast hour.

Diet from eighteen months to the end of two and one-half years, four meals a day:—

First meal, 7 A.M.—A breakfast-cupful of new milk; the yolk of an egg lightly boiled; two thin slices of bread and butter.

Second meal, 11 A.M.—A teacupful of milk with a soda biscuit.

Third meal, 2 P. M.—A breakfast-cupful of beef tea, mutton or chicken broth; a thin slice of stale bread; a saucer of rice-and-milk pudding.

Fourth meal, 6.30 P. M.—A breakfast-cupful of milk with bread and butter.

On alternate days:—

First meal, 7 A. M.—Two tablespoonfuls of thoroughly cooked oatmeal or wheaten grits with sugar and cream; a teacupful of new milk.

Second meal, 11 A. M.—A teacupful of milk with a slice of bread and butter.

Third meal, 2 P. M.—One tablespoonful of underdone mutton pounded to a paste; bread and butter, or mashed baked potato, moistened with good plain dish gravy; a saucer of junket.

Fourth meal, 6.30 P. M.—A breakfast-cupful of milk, a slice of soft milk toast, or a slice or two of bread and butter.

When sickness supervenes, all that is ordinarily necessary is a reduction of the diet to plain milk, or milk with Mel-lin's Food.

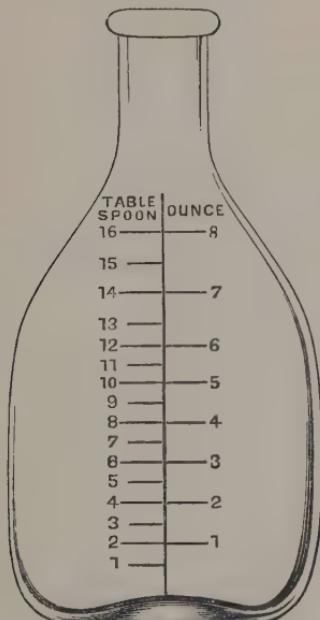
An important point often neglected is the matter of drink. Even the youngest infant requires water several times daily, and the demand increases with age. The water must be as pure as possible and should not be too cold, although in the heat of summer bits of ice and water moderately cooled by ice can be allowed without harm.

The foregoing schedule must, of course, be regarded only as an average. Many children can bear nothing but milk food up to the age of two or even three years, and, provided enough be taken, no fear for their nutrition need be entertained. If a child be thriving on milk, he is never to be forced to take additional food merely because a certain age has been reached; let the healthy appetite be the guide.

d. Success in hand-feeding depends quite as much on the administration as upon the preparation of the food.

From birth up to such time as broth, bread, and eggs are added to the diet, all the food should be taken from a bottle, and even after this; as the bottle is a comfort and insures slow feeding, it may be allowed for milk preparations, until

FIG. 16.



GRADUATED NURSING BOTTLE.

the child of his own accord tires of it. The only feeding apparatus to be admitted to the nursery is the simple bottle and tip. The bottle represented in the accompanying figure was prepared at my suggestion by Mr. J. J. Ottenger, of Philadelphia. Its interior surface presents no angles for the

collection of milk; it is easily cleaned, and the graduated scale is convenient for nursery use.

All complicated arrangements of rubber and glass tubing are not only an abomination, but a fruitful source of sickness and death. Rather than use them, it is far better to feed the infant with a spoon. In England, a bottle with a long rubber tube is almost universally employed. Should this be abandoned and a simple bottle and a rubber tip used, the objections of some authors to bottle-feeding would vanish.

The bottle shaped as above must be of transparent flint glass, so that the slightest foulness can be detected at a glance, and may vary in capacity from six to twelve fluid-ounces, according to the age of the child. Two should be on hand at a time, to be used alternately. Immediately after a meal the bottle must be thoroughly washed out with scalding water, filled with a solution of bicarbonate or salicylate of sodium—one teaspoonful of either to a pint of water—and thus allowed to stand until next required; then the soda solution being emptied, it must be thoroughly rinsed with cold water before receiving the food. The tips or nipples, of which there should also be two, must be composed of soft,

FIG. 17.



BOTTLE TIP.

flexible India-rubber, and a conical shape is to be preferred, as being more readily everted and cleaned; the opening at the point must be free, but not large enough to permit the milk to flow in a stream without suction. At the end of each feeding the nipple must be removed at once from the bottle, cleansed externally by rubbing with a stiff brush wet with cold water, everted and treated in the same way, and then placed in cold water and allowed to stand in a cool place until again wanted.

While taking these precautions for perfect cleanliness, the

nurse must satisfy herself of their efficacy by smelling both the bottle and the tip just before they are used, to be sure of the absence of any sour odor.

Next to cleanliness of the feeding apparatus, it is important to insist upon the separate preparation of each meal immediately before it is to be given. The practice of making in the morning the whole day's supply of food, though it save trouble, is a most dangerous one. Changes almost invariably take place in the mixture, and by the close of the day it becomes unfit for consumption.

When the graduated bottle is not at hand, a common glass graduate, marked for fluidrachms and ounces and holding a pint, should be provided for the nursery. Some moments before meal-time, so as to avoid hurry, the different fluid ingredients of the food are to be measured in this, one after the other; the requisite quantity of milk sugar is then added, and the whole mixed thoroughly, by stirring with a spoon, and poured into the feeding bottle. When the graduated bottle is employed, thorough shaking is sufficient. The food must now be heated to a temperature of about 95° F. This can be done by steeping the bottle in hot water, or by placing it in a water-bath over an alcohol lamp or gas jet. Finally, the tip is applied and the meal is ready.

When feeding, the child must occupy a half-reclining position in the nurse's lap. The bottle should be held by the nurse, at first horizontally, but gradually more and more tilted up as it is emptied, the object being to keep the neck always full and prevent the drawing in and swallowing of air. Ample time, say five, ten or fifteen minutes, according to the quantity of food, should be allowed for the meal. It is best to withdraw the bottle occasionally for a brief rest, and after the meal is over, sucking upon the empty bottle must not be allowed, even for a moment.

e. For children residing in cities, an honest dairyman must be found, who will serve sound milk and cream from country cows once every day in winter and twice during the day in the heat of summer. The milk of ordinary stock cows is more suitable than that from Alderney or Durham breed, as the latter is too rich and, therefore, more difficult to digest. The mixed milk of a good herd is to be preferred to that from a single animal. It is less likely to be affected by peculiarities of feeding, and less liable to variation from alterations in health or different stages of lactation.

The care of the herd and of the milk is of great consequence. The cows should be healthy, and the milk of any animal that seems indisposed should not be mixed with that from perfectly healthy animals. The cows must not be fed upon swill or the refuse of breweries, glucose factories, or any other fermented food. They must not be allowed to drink stagnant water, and must not be heated or worried before being milked. The pasture must be free from noxious weeds, and the barn and yard must be kept clean. The udders should be washed, if dirty, before the milking. The milk must be at once thoroughly cooled. This is best accomplished by placing the can in a tank of cold spring water, or in ice water, the water being of the same depth as the milk in the can. It is well to keep the water in the tank flowing; indeed, this is necessary unless ice water be used. The can should remain uncovered during the cooling and the milk should be gently stirred. The temperature should be reduced to 60° F. within an hour, and the can must remain in the cold water until the time for delivering.

In summer, when ready for delivery, the top should be placed in position and a cloth wet in cold water spread over the can, or refrigerator cans may be used. At no season

should the milk be frozen, but at the same time no buyer should receive milk having a temperature over 65° F.

The milk and cream must be transported from the dairy in perfectly clean vessels. To insure this it is best to provide two sets of small cans, one set to be thoroughly cleansed and aired while the other is taken away by the milkman to carry back the next supply. So soon as this arrives in the morning, or in the morning and evening in hot weather, the cans should be emptied into separate and absolutely clean earthenware or glass pitchers, and these put at once into a refrigerator reserved exclusively for them. This may stand in some convenient spot near the nursery, but not in it, and especially not in an adjoining bath room. With a good refrigerator there is no difficulty in keeping milk perfectly sweet for twenty-four hours in winter and for twelve hours in summer, except on intensely hot days; then it may be necessary to scald or lightly boil the whole of the supply when received, in order to prevent change.

It is a well-known fact that milk is a fluid having active powers of absorption, and that it frequently acts as the medium of transmission of the contagion of such diseases as scarlatina, diphtheria and typhoid fever. Doctor V. C. Vaughan has also lately discovered in milk a special poison which he terms *tyrotoxicon* (cheese poison).

The clinical element of interest in these discoveries is the close analogy between the symptoms produced by the experimental use of *tyrotoxicon* and those observed in cholera infantum—an analogy suggestive of the possibility of the latter disease being chiefly due to poisoned milk. This causal relation is scarcely more than a theory, though certain well-known features of the disease seem to bear it out. Thus, the affection occurs at a season when decomposition of milk takes place most rapidly; it occurs at places where

absolutely fresh milk cannot be obtained; it prevails among classes of people whose surroundings are most favorable to fermentative changes; it is most fatal at an age when there is the greatest dependence upon milk as a food, when the gastro-intestinal mucous membrane is most susceptible to irritants, and when irritation and nervous fevers are most easily produced.

Drs. Newton and Wallace, of the New Jersey State Board of Health, have reported a number of cases of poisoning by milk that occurred in different hotels at Long Branch. These observers found that the affected milk was all obtained from one milkman, and that the cows furnishing it were milked at the unusual hours of midnight and noon. The noon milking was immediately placed in cans without being cooled, and "carted eight miles during the warmest part of the day in a very hot month." It was this milk that produced the poisonous effects, the morning's milk being always good. No statement is made as to the health of the cows or the nature of the poison, but there is a probability of its having been tyrotoxicton, and of this material or its ferment having been generated by the careless collection and transportation of the milk, combined with the high atmospheric temperature.

Childhood.—Children who have cut their milk teeth may be fed for a twelvemonth—namely, up to the age of three and a half years—in the following way:—

First meal, 7 A. M.—One or two tumblerfuls of milk, a saucer of thoroughly cooked oatmeal or wheaten grits, and a slice of bread and butter.

Second meal, 11 A. M. (if hungry).—A tumblerful of milk or a teacupful of beef tea with a biscuit.

Third meal, 2 P. M.—A slice of underdone roast beef or mutton or a bit of roast chicken or turkey, minced as fine

as possible; a baked potato thoroughly mashed with a fork and moistened with gravy; a slice of bread and butter; a saucer of junket or rice-and-milk pudding.

Fourth meal, 7 P.M.—A tumblerful of milk and one or two slices of well-moistened milk toast.

From three and a half years up the child must take his meals at the table with his parents, or with some reliable attendant who will see that he eats leisurely. The diet, while plain, must be varied. The following list will give an idea of the food to be selected:—

BREAKFAST.

EVERY DAY.

Milk.	Fresh fish.	Eggs, plain omelette.
Porridge and cream.	Eggs, lightly boiled.	Chicken hash.
Bread and butter.	“ poached. “ scrambled.	Stewed kidney. “ liver.

Sound fruits may be allowed before or after the meal, according to taste, as oranges, grapes without pulp (seeds not to be swallowed), peaches, thoroughly ripe pears, cantaloupes and strawberries.

DINNER.

EVERY DAY.

Clear soup:	Potatoes, baked.	Hominy.
Meat, roasted or broiled, and cut into small pieces.	“ mashed.	Macaroni, plain.
Bread and butter.	Spinach. Stewed celery. Cauliflower.	Peas. String-beans, young. Green corn, grated.

Junket, rice-and-milk or other light pudding, and occasionally ice cream, may be allowed for dessert.

SUPPER.

EVERY DAY.

Milk.
Milk toast or bread and butter.
Stewed fruit.

Fried food, highly-seasoned or made-up dishes are to be excluded; no condiment but salt is to be used, and the formation of a habit of eating between meals must be avoided.

Filtered or spring water should be the only drink; tea, coffee, wine or beer being entirely forbidden.

As to the quantity, a healthy child may be permitted to satisfy his appetite at each meal, under the one condition that he eats slowly and masticates thoroughly.

In case of illness, the diet must be reduced in quantity and quality, according to the rules that are applicable to adults.

CHAPTER IX.

DIETARY.

In the preceding chapter so much attention has been devoted to the subject of the artificial feeding of infants, and so many formulas have been given for the preparation of cows' milk as a substitute for the natural food, or human milk, that it will only be necessary here to refer briefly to a few milk mixtures, some of which have been recommended by other writers. After describing these, the methods of peptonization will be discussed, and finally the mode of preparing a number of dishes adapted to the nursery whether occupied by well or ill children. In regard to the latter, however, the dishes that ordinarily come upon the table will not be referred to, as any good cook ought to know how to make them.

MILK FOODS.

ARROWROOT FOOD.

Milk,	
Cream,	
Lime water,	
Arrowroot water	Of each 2 tablespoonfuls.
Sugar	1 teaspoonful.

This is the late Dr. J. F. Meigs' formula for a child of about nine months of age. The arrowroot water is made in the proportion of one teaspoonful of arrowroot to a pint of boiling water.

CHAVASSE'S MILK FOOD.

New milk,	
Water, warm	Of each equal parts.
Table salt	A small pinch.
Lump sugar . . .	A sufficient quantity to slightly sweeten the mixture.

Let the milk and the water be of the same temperature—90° F.—before mixing. This preparation does well for a child of three or four months; the total quantity for each meal being from eight to twelve tablespoonfuls.

CONDENSED MILK.

Condensed milk	1 teaspoonful.
Water	6 tablespoonfuls.

Use hot water; mix by stirring and let the temperature fall to ordinary heat before administration.

MILK AND CINNAMON.

Milk sugar	1 teaspoonful.
Brandy	1 teaspoonful.
Milk	½ pint.
Powdered cinnamon	A sufficiency to flavor.
Mix thoroughly.	

Useful in diarrhoea; may be administered warm or cold.

MILK AND OATMEAL.

Bethlehem oatmeal (fine powder)	1 teaspoonful.
Water	2 tablespoonfuls.
Milk	5 tablespoonfuls.
Cream	1 tablespoonful.
Sugar of milk	1 teaspoonful.

Heat the water just short of boiling; stir in the oatmeal

slowly until a smooth white mixture is obtained; then add the other ingredients.

This is adapted for an infant of three months, and forms a useful mixture in cases of constipation.

MILK-SUGAR FOOD.

Milk	1 tablespoonful.
Cream	2 tablespoonfuls.
Lime water	2 tablespoonfuls.
Milk-sugar solution	3 tablespoonfuls.

For a child under a month, quantity to be increased as age advances, but no change to be made in quality until after the eighth or ninth month.

The milk-sugar solution consists of $17\frac{3}{4}$ drachms—a little over 17 teaspoonsfuls of milk sugar to a pint of pure water.

This is the food recommended by Dr. A. V. Meigs.

MILK AND WHITE-OF-EGG FOOD.

The whites of three eggs.

Lime water	3 tablespoonfuls.
Milk	1 pint.

Shake the egg and lime water forcibly together for five minutes; then add the milk slowly with constant stirring, occupying ten minutes in the process; keep in a cool place.

PEPTONIZED FOODS.

For the process of peptonization, or predigestion, the Extractum Pancreatis, prepared by Fairchild Bros. and Foster, of New York, gives, in my experience, the most satisfactory results, and in all the receipts given below, this preparation is to be used.

PEPTONIZED MILK, No. 1.

One peptonizing tube.

Water 1 teacupful.

Milk, fresh and cold 1 pint.

Put the powder contained in the tube into a clean quart bottle; add the cold water and shake well; then pour in the milk and shake the mixture thoroughly again. Place the bottle in water of about 115° F., or so hot that the whole hand can be held in it without discomfort for a minute, and keep the bottle there for twenty minutes. Then put the bottle in contact with ice to check further digestion and keep the milk from spoiling.

Peptonized milk should have a slightly but not decidedly bitter taste. It may be made palatable by serving with grated nutmeg, sugar, or a little brandy, or it may be taken with Apollinaris or Vichy water. In the latter case put the water first into the glass, then quickly pour in the peptonized milk and drink while effervescing.

PEPTONIZED MILK, No. 2.

Mix the peptonizing powder, water and milk, in a bottle, and place in a hot-water bath exactly as directed in the above. Let the bottle remain in the hot water for *two hours*, then pour into a saucepan and *heat to boiling*. This specially peptonized milk is used in making jellies, etc. It may be immediately used if required hot, or set aside on ice for punches, etc.

The object of raising the liquid to the boiling point is to abolish the activity of the pancreatin, so that it may not act secondarily upon other substances prepared with the milk.

SLIGHT PEPTONIZATION.

Take the same ingredients and mix them as before, but immediately place the bottle on ice without subjecting it to any heat.

This preparation is useful in cases of enfeebled digestive power, or as a means of returning from predigested to ordinary milk. It has no especial taste.

PEPTONIZED MILK GRUEL.

One peptonizing tube,	
Wheat flour or arrowroot	1 heaping teaspoonful.
Water, cold	$\frac{1}{2}$ pint.
Milk, cold	1 pint.

Make a smooth mixture of the arrowroot and water; heat this with constant stirring until it has boiled briskly for three minutes; next add the milk; strain into a pitcher and stir in the peptonizing powder; let the mixture stand in the hot-water bath, 115° F., for thirty minutes; then pour into a clean bottle and place on ice.

PEPTONIZED MILK PUNCH.

Fill an ordinary thin glass tumbler one-third full of cracked ice; pour on it from one to four teaspoonfuls, according to the child's age, of St. Croix rum, and a dash of Curaçoa; add sugar to taste, and then fill the glass with peptonized milk; shake well and grate a little nutmeg on top; strain.

EFFERVESCENT MILK PUNCH.

Prepare the tumbler and ice as in the above, squeeze in the juice of half a lemon, add sugar to sweeten, and fill the glass with half Apollinaris and half peptonized milk. The milk used in this punch must be prepared by the second process.

PEPTONIZED BEEF TEA.

To one-quarter of a pound of minced raw beef, entirely free from fat, add one-half pint of cold water; cook over a slow fire, with constant stirring, until it has boiled a few minutes, then pour off the liquor and beat or rub the meat to a paste; put the latter into a jar with one-half pint of cold water, and pour in the liquor previously obtained. Add to this mixture thirty grains of Extract of Pancreas and twenty grains of bicarbonate of sodium; shake all well together, and keep at a temperature of about 110° F., stirring occasionally, for three hours. Next boil quickly, strain, and serve as required.

PEPTONIZED OYSTERS.

(Originally suggested by the late Dr. N. A. Randolph.)

Take half a dozen large oysters with their juice and half a pint of water. Heat in a saucepan until they have boiled briskly for a few minutes. Pour off the broth and set aside. Mince the oysters fine, and reduce them to a paste with a potato masher in a wooden bowl. Next put the oysters in a glass jar with the broth which has been set aside and add the contents of a peptonizing tube. Let the jar stand in hot water or in a warm place, where the temperature is not above 115° F., for one and a half hours. Next pour into a saucepan and add half a pint of milk; heat over the fire slowly to boiling point, and flavor with salt to taste, and serve hot.

“HUMANIZED MILK.”

Peptogenic milk powder	1 measure.*
Milk, fresh and cold	4 tablespoonfuls.
Water	4 tablespoonfuls.
Cream	1 tablespoonful.

* The proper measure is furnished with each box of powder.

Heat cautiously over a flame for six minutes, stirring constantly with a spoon and tasting often, so that it shall not get too hot to be sipped— 115° F. Now put into a nursing bottle, and it is ready for feeding. The cup should be held by the hand, over the flame, thus making it easy to regulate the heat to which the milk is exposed.

It is important to follow out these directions *absolutely*, for should the temperature of the mixture not be maintained at a sufficiently high point, the Pancreatin contained in the peptogenic powder will perform its work imperfectly; on the other hand, should the heat be too great all digestive activity will be suspended.

Humanized milk so prepared is adapted to the average infant's digestion. As age advances, the proportion of milk must be increased and the total quantity of the mixture augmented. As an increase in quantity is made, it is necessary to preserve the relations of the peptogenic powder to the liquid, namely, one measure to each four ounces and a half.

Sometimes it will be found necessary to carry the process of predigestion further than can be accomplished by following the directions already given. This may be readily done by increasing the length of the time of heating, thus, one can easily produce in the milk any degree of change up to complete peptonization, when the liquid becomes clear and very bitter. Conversely, when it is desirable, in case of returning health, for instance, to resume a plain milk diet, the time of heating is gradually shortened until the powder is added to the milk mixture just at the time of feeding. When the time comes to abandon the digesting powder entirely, it is most important to supply its place in the food by an equal bulk of milk sugar.

The milk and cream referred to are of such quality as can be obtained from a reliable city server; extra rich milk or cream may, under some circumstances, require to be more diluted.

MEAT BROTHS, ETC.

BEEF TEA, No. 1.

Take one pound of lean beef and mince it; put it, with its juice, into an earthen vessel containing a pint of clear water at a temperature of 85° F., and let the whole stand for one hour. Strain well through stout muslin, squeezing all juice from the meat; place on the fire, and, while stirring briskly, slowly heat the liquid just to the boiling point. Then remove at once and season with salt.

When administering this be careful to stir up whatever sediment may be present.

BEEF TEA, No. 2.

Take half a pound or a pound—according to strength required—of rump steak; cut it into small pieces; free it completely from fat and tendon, and put it with one pint of clear, cold water into a covered saucepan. Place by the side of the fire for five hours; then let it simmer gently for two hours, and finally skim thoroughly. The meat used should be as fresh as possible, and the saucepan should be of copper or tin, or be enameled on the inner surface.

Beef tea must never be allowed to boil, and in reheating be careful to raise it only to the proper point for drinking.

BEEF TEA IN FIFTEEN MINUTES.

Scrape one pound of lean beef into fibres, and, after placing it in a clean saucepan, pour on half a pint of boiling water; then cover the saucepan closely, and place it by

the side of the fire for ten minutes ; next strain into a tea-cup ; place this in a basin of ice-cold water and remove all fat from the surface of the liquid, first with a spoon and finally with a piece of stale bread or blotting paper ; then pour into a warm cup and heat gently to the temperature for drinking.

BEEF ESSENCE, No. 1.

Thoroughly mince one pound of rump steak ; place it with three tablespoonfuls of water in a mortar ; pound it well and put it aside to soak for two hours. Then put it, with a pinch of salt, in a covered earthen jar ; cement the edges of the cover with dough and tie a piece of cloth over the top. Place the jar in a pot half full of boiling water, and keep the whole on the fire, simmering, for four hours. Then, through a coarse sieve, strain off the liquid essence, which will amount to about six ounces.

One teaspoonful will be sufficient for a young child.

BEEF ESSENCE, No. 2.

Half a pound of fresh beef must be minced as finely as possible ; add to this half a pint of pure cold water, an egg-spoonful of salt and five drops of pure muriatic acid. Mix well, and after standing an hour pass through a conical sieve without pressure, refiltering until the liquid runs clear. Next a second half pint of water is poured on the residue upon the sieve and allowed to filter through without pressure.

The dose of this is two tablespoonfuls for a child of twelve years, a teaspoonful for one under one year.

RAW-BEEF JUICE.

Take one pound of sirloin of beef ; warm it in a broiler before a quick fire ; cut into pieces half an inch square, and after placing in a lemon squeezer or meat press, forcibly ex-

press the juice; remove the fat that rises to the surface after cooling.

This may be given warm or cold, and seasoned with a little salt, in doses of one teaspoonful every two hours to a child of six months or a year old.

The meat must never be actually cooked.

RAW BEEF.

Cut a tenderloin beefsteak into the finest possible pieces and free it as nearly as may be from particles of fat; then place in a mortar and pound until the meat becomes pulpy; next rub through a fine sieve and season with salt and a little black pepper.

A teaspoonful of this pulp three or four times daily will be sufficient for a child of one year old.

CLEAR BROWN SOUP.

Cut a shin of beef into pieces; put it into a saucepan with just enough water to cover it; when it boils, skim it, and add a bundle of sweet herbs, a little turnip, carrot, onion and celery, also a little pepper and salt. Let the whole boil until the meat is quite tender; then strain, and let it stand till the next day. After clearing it thoroughly from fat, heat it again, adding as much browning as will make the soup the color you like. Beat up two eggs, with their shells crushed, till they are quite a froth. Put them into the soup with a whisk; let it boil gently for ten minutes; then strain it through a cloth, and it will be perfectly bright. (Dr. Ellis.)

CONSOMMÉ.

Make a beef broth by taking one or two pounds of beef, according to the strength required, from the leg, round or chuck; wash well; cut in pieces and put on to boil in three

quarts of cold water. While boiling, skim frequently, and when reduced to one quart, take from the saucepan and strain; after which return to the saucepan with a few thin slices of onion, and half a pound of lean beef, chopped fine, and well mixed with three raw eggs; beat all thoroughly with the broth, which is to be returned to the fire and boiled for about half an hour, or until perfectly clear.

CHICKEN BROTH.

A small chicken, or half of a large fowl, thoroughly cleaned, and with all the skin and fat removed, is to be chopped, bones and all, into small pieces; put these, with a proper quantity of salt, into a saucepan and add a quart of boiling water; cover closely and simmer over a slow fire for two hours; after removing, allow to stand, still covered, for an hour, and strain through a sieve.

MUTTON BROTH.

Lean loin of mutton . . . 1 pound (exclusive of bone).
Water 3 pints.

Boil gently until very tender, adding a little salt or onion, according to taste; strain into a basin, and, when cold, skim off all the fat. Warm when served.

Should barley or rice be added, they must be first separately and thoroughly boiled, and added when the broth is heated for use.

VEAL BROTH.

Lean veal $\frac{1}{2}$ to 1 pound, according to
strength required.
Cold water 1 pint.

Mince the meat; pour upon it a pint of cold water; let it stand for three hours; then slowly heat to boiling point,

and after boiling briskly for two minutes, strain through a fine sieve and season with salt.

OYSTER SOUP.

Drain one pint of oysters through a colander for five minutes, to remove the liquor, and then pour over them one pint of boiling water, which must be thrown aside ; add to the liquor already drained a pint of boiling water and put over the fire in a porcelain-lined saucepan. Boil until all the scum has risen and been skimmed off; then add half a pint of fresh milk, one water cracker rolled to a powder, a piece of butter, and a little salt and pepper ; boil ten minutes, and just before the soup is to be served turn in the oysters from the colander and let them scald for three minutes.

ARROWROOT PUDDING.

Mix a tablespoonful of arrowroot with cold water ; put it over the fire in a porcelain-lined saucepan ; add a pint of boiling milk—stirring constantly—and one egg well beaten with a tablespoonful of white sugar ; let it boil five or ten minutes.

If baked pudding is preferred, it may be mixed in the same way and baked, in a moderately quick oven, for twenty or thirty minutes.

BLANC MANGE.

Gelatine	$\frac{1}{2}$ ounce.
Water	$\frac{1}{2}$ pint.
Cream	1 pint.
White sugar	3 ounces.
Extract of lemon	Sufficient to flavor.

Dissolve the gelatine in the water by means of heat, meanwhile whipping the cream and sugar together and

adding the lemon. Next, while the gelatine solution is still warm, pour in the cream slowly, and beat until stiff enough to drop from the spoon; finally pour in moulds.

Milk may be used instead of water in this preparation.

HOMINY GRITS.

Two tablespoonsfuls of hominy, having been boiled soft, are rubbed up with butter until quite light; then, half a pint of boiled milk is added slowly, with constant stirring; next strain through a sieve and boil again; flavor with sugar or salt, and serve hot. Rice may be prepared in the same way.

JUNKET.

Milk 1 pint.

Essence of pepsin, (Fairchild's) 2 teaspoonfuls.

(Wine of pepsin or liquid rennet may also be used.)

Heat the milk just to a temperature that can be readily borne in the mouth, and add, with gentle stirring, the curdling agent; allow to stand until firmly curded, and serve with sugar, nutmeg or cream as desired.

MILK AND GELATINE.

Gelatine 1 tablespoonful.

Barley water, hot $\frac{1}{2}$ pint.

Powdered sugar 2 tablespoonfuls.

Milk 1 pint.

Dissolve the gelatine in the hot barley water; add the sugar, and then the milk; stirring all together.

RICE-MILK.

Rice 2 tablespoonfuls.

Corn-starch 1 teaspoonful.

Milk 2 pints.

Boil in a farina boiler until each grain of the rice becomes saturated, and the whole creamy in color.

RICE PUDDING.

Take three ounces of rice, and swell it very gently in one pint of new milk. Let it cool; then stir into it one ounce of fresh butter, two ounces of pounded sugar, the yelks of three eggs, and some grated lemon rind. Pour this into a well-buttered dish, but do not quite fill it, and then lay lightly over the top the whites of three eggs which have been well beaten up with three tablespoonfuls of sifted sugar. Put the pudding directly into the oven, the heat of which must be moderate, and bake it for about twenty minutes, or till the egg crust has become lightly browned.

OATMEAL GRUEL.

Mix a large tablespoonful of oatmeal with two tablespoonfuls of cold water, stirring to bring to a state of uniformity; then pour into a pint of boiling water in a saucepan, and boil and stir well for ten minutes. Flavor with salt or sugar.

If the boiling be continued for half an hour, the mixture thickens into a porridge.

SAGO JELLY.

Take two tablespoonfuls of sago; wash carefully; soak for four hours in a half pint of cold water, and then add half a pint of hot water, a pinch of salt, a tablespoonful of sugar and a little grated lemon peel; boil gently fifteen minutes, stirring constantly. A little port wine or sherry may be added just before removing from the fire.

May be served hot or cold.

TAPIOCA.

Wash two tablespoonfuls of the best tapioca; soak in fresh water over night; add a little salt, a pint of milk or water, and simmer until quite soft, stirring frequently if milk be used; then pour into a bowl and stir while cooling, at the same time adding sugar, some flavoring substance and wine if required.

TAPIOCA PUDDING.

Beat the yolks of two eggs with half an ounce of sugar; stir into a pint of tapioca mucilage made with milk, as directed above, and bake in a slow oven.

EGG-AND-BRANDY.

Brandy	8 tablespoonfuls.
Cinnamon water	8 tablespoonfuls.
The yolks of two eggs.	
White sugar	1 tablespoonful.

Rub the yolks and sugar together; then add the cinnamon water and spirit.

A dessertspoonful to two tablespoonfuls may be given every two hours, according to the age of the child.

WINE WHEY.

Boil a pint of fresh milk; while boiling, pour in eight tablespoonfuls of sherry wine; bring it to the boil a second time, being careful not to stir it; so soon as it boils, put it aside until the curd settles, and pour off the clear whey.

FLAXSEED TEA.

Whole flaxseed	1 ounce.
Bruised licorice root	2 teaspoonfuls.
Water, boiling	1 pint.

Pour the boiling water over the flaxseed and licorice

cover lightly; digest for three hours near a fire, and strain. Two tablespoonfuls of lemon juice may be used as the flavor, instead of the licorice.

The following preparations are useful as additions to milk in bottle feeding:—

CARAWAY WATER.

Caraway seeds, crushed	2 tablespoonfuls.
Water	1 pint.

Enclose the seeds in a small muslin bag, and boil in the water until the latter is reduced to half a pint.

One or two teaspoonfuls may be added to the bottle in case there be colic.

BARLEY WATER.

Put two teaspoonfuls of washed pearl barley into a saucepan with a pint of clear water, and boil slowly down to two-thirds of a pint; strain through muslin.

Employed to prevent the formation of large, compact curds.

GELATINE.

Put a piece of plate gelatine, an inch square, into half a tumblerful of cold water, and let it stand for three hours; then turn the whole into a teacup, place this in a saucepan half full of water, and boil until the gelatine is dissolved. When cold, this forms into jelly.

From one to two teaspoonfuls may be added to each bottle of milk food.

Employed for same object as the above.

FLOUR BALL.

Take a pound of good wheat flour—unbolted, if possible—tie it up very tightly in a strong pudding-bag; place it in a saucepan of water and boil constantly for ten hours; when cold remove the cloth; cut away the soft outer cover-

ing of dough that has been formed, and reduce the hard, baked interior by grating.

In the yellowish-white powder obtained, almost all the starch has been converted into dextrine by the process of cooking, and the proportion of the nitrogenous principle to the calorifacient is as one to five—nearly the same as in human milk.

This acts both mechanically and as a food.

LIME WATER.

Take a piece of unslaked lime as large as a walnut; drop it into two quarts of filtered water contained in an earthen vessel; stir thoroughly; allow to settle, and use only from the top; replacing the water and stirring as consumed.

OATMEAL WATER.

First prepare an oatmeal porridge; take a heaping teaspoonful of this, put it into a quart of cool water, heat with constant stirring, to the boiling point, and strain.

This may be used in milk-foods as a substitute for ordinary water if constipation be present.

PEARL BARLEY JELLY.

Put two tablespoonfuls of washed pearl barley into a quart saucepan with a pint and a half of clear water and boil slowly down to a pint; strain, and allow the liquid to set into a jelly.

Used for same purpose as barley water.

RICE WATER.

Put two tablespoonfuls of rice, thoroughly washed, into a quart of water and place near the fire, where it may soak

and be kept warm for two hours; then boil slowly for one hour, or until the water is reduced one-half, and strain.

Useful as a diluent for milk in cases of diarrhoea.

WHEY.

Milk	1 pint.
Essence of pepsin	2 teaspoonfuls.

Heat the milk up to a point that can be agreeably borne by the mouth, and add the pepsin with gentle stirring; let the whole stand until firm coagulation has taken place; then beat with a fork until the curd is finely divided, and strain.

NUTRITIOUS ENEMATA.

The process of peptonization, already described, is very useful in the preparation of food for absorption by the lining membrane of the rectum. Any of the predigested foods may be used in this way, the only caution being to administer them in small quantities—not over four tablespoonfuls—and at intervals of not less than four hours. It is essential, too, in rectal alimentation to keep the lower bowel clear by a daily laxative injection of warm water.

When the materials for proper peptonizing are not at hand, one of the following enemata may be used with advantage in the interim:—

MEAT ENEMA WITH PEPSIN.

Essence of meat, No. 2	8 tablespoonfuls.
Gelatine (page 174)	1 tablespoonful.
Pepsin	4 grains.
Muriatic acid	4 drops.

First mix the essence and gelatine, and warm in a water bath at 112° F.; then dissolve the pepsin in a teaspoonful

of warm water by the aid of the acid; stir it into the first mixture and let the whole remain warm for two hours.

Administer warm with two drops of laudanum to secure retention.

The bulk of this enema is adapted for a child of eight or twelve years.

BEEF-TEA AND BRANDY ENEMA.

Strong beef tea 3 tablespoonfuls.

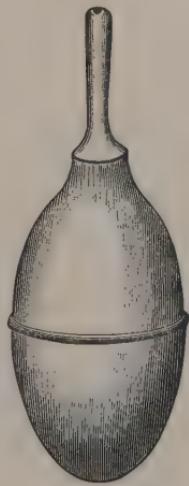
Cream 1 teaspoonful.

Brandy 1 teaspoonful.

Stir all together, and administer gently and slowly.

Should this injection not be retained, add two drops of laudanum at each administration. The best syringe for these injections is shown in Fig. 18.

FIG. 18.



SYRINGE FOR NUTRIOUS ENEMATA.

CHAPTER X.

EMERGENCIES.

In the first Chapter, attention was directed to certain deviations from the features of health that should lead the mother or nurse to suspect the onset of disease. In addition to these, it is of great service to take into account the four seasons of the year, and to be informed of what diseases are most apt to prevail during each.

In the late fall and early winter catarrhal affections are common. In catarrh there is an increased secretion of mucus from the lining membrane of either the nose, the throat, the air-tubes or the digestive canal, attended by fever, loss of appetite, thirst and lassitude, with sneezing, hoarseness, cough, vomiting or diarrhoea, according to the situation of the disease.

As winter advances, the bronchial tubes, the lungs themselves and their investing membrane—the pleuræ—are liable to attack, and the signs of bronchitis, pneumonia or pleurisy to be developed.

In the changeable weather of spring, together with the catarrhal and inflammatory disorders already mentioned, epidemics of measles, scarlet fever and chicken pox are most prevalent; while during the summer months, disorders of the bowels, such as diarrhoea, summer complaint and cholera infantum, swell the mortality lists of the larger cities.

Again, the influence of any hereditary tendency to disease should always be present in the mother's mind, as this not only makes her alive to the possibility of the onset of

illness and leads her to seek medical advice in time, but also induces her to anxiously shield her child from known exciting causes, and to adopt hygienic measures calculated to overcome the constitutional predisposition.

In considering the question of emergencies, under which term will be included both accidents and certain conditions of disease, no reference will be made to the management of serious disorders, for these, even in their earliest stages, must receive the attention of a physician.

ACCIDENTS AND DISORDERS OCCURRING AT BIRTH OR SOON AFTER.

INJURIES RECEIVED DURING BIRTH.

The shape of the head is sometimes altered by the compression it is subjected to during a prolonged and difficult labor. The deformity is usually in the direction of elongation. The distance from the chin to the back of the head at times measuring six inches or even more. There is no ground for apprehension in these cases, and the head will regain its natural shape without mechanical interference.

Swellings upon the scalp are quite common. They are due to pressure sustained by the parts in labor. Such tumors gradually subside, if kept free from compression and frequently bathed with cooling lotions; of the latter, alcohol and water, the extract of witch-hazel and water, or diluted lead water are serviceable.

The face may be congested and blackened and the features disfigured and distorted from the same cause. A natural appearance, however, will be recovered in a few days without any treatment.

BLEEDING FROM THE NAVEL STRING.

This serious accident occasionally occurs some hours after birth. It arises from the cord being carelessly tied or from its being unusually large at birth, and subsequently shrinking so that the ligature ceases to close the blood vessels.

To arrest the hemorrhage, the infant's clothes and flannel binder must be removed and the cord exposed; then a new ligature, composed of six strands of strong linen thread, must be applied half an inch nearer the body than the original one, and tied tight enough to compress thoroughly the vessels, but not so tight as to cut through the cord.

ULCERATION OF THE NAVEL.

The cord generally separates from the navel between the fifth and fifteenth day after delivery, and the parts should then heal without trouble. Occasionally, after the falling of the cord a small growth, about as large as a pea, appears on the navel, giving rise to a discharge of thin liquid. This may be relieved by applying a little powdered alum and afterward dressing with vaseline or oxide of zinc ointment.

Again, though rarely, excoriation of the navel and surrounding skin takes place, and rapidly spreads, assuming an inflammatory character. The attention of the physician must be called to this. Apply a warm water dressing should his visit be delayed.

SECONDARY BLEEDING FROM THE NAVEL.

At the time of, or several days after, the separation of the cord, bleeding may take place from the navel. In this event, which is fortunately uncommon, place the point of the finger over the part and steadily, but gently, press it until medical aid can be obtained.

When a bleeding growth appears at the navel wind a piece of very narrow tape closely around it and leave the whole undisturbed. Under these circumstances the hemorrhage quickly stops and the growth soon sprouts over the upper edge of the tape and, strangulating itself, drops off.

YELLOW STAINING OF THE SKIN.

During the first few days of life, especially after a difficult and tedious birth, there is apt to be intense congestion of the skin, followed, as the redness fades, by a brownish-yellow discoloration. This usually disappears by the tenth day. The coloration resembles that of true jaundice, but there is no yellow staining of the whites of the eyes, nor change in the color of the urine or fæces. Real jaundice occasionally occurs and is a serious condition, requiring careful management.

RETENTION OF URINE AND FÆCES.

Infants frequently do not pass urine for many hours after birth. Sometimes not for days. This may be due to complete want of secretion or to some temporary engorgement of the kidneys, which can be relieved by drawing the blood to the surface by immersion in a warm bath; a procedure to be adopted in all cases in which no urine is voided during the first twenty-four hours of life. Often, in lieu of the bath, it will suffice to lay a piece of flannel, wrung out of hot water, upon the lower third of the abdomen—the region over the bladder.

Occasionally some physical malformation leads to retention of urine, and it is the duty of the nurse to be on the lookout, so that she may early call the physician's attention to the matter. The same condition may also prevail in the bowel, and when twelve hours elapse without any evacuation the parts ought to be carefully examined.

SWELLING OF THE BREASTS.

At birth, or within the following day or two, the mammary glands of an infant may swell, become hard and painful, and secrete a thin fluid much resembling milk. Never make any pressure to remove the secretion, as it may lead to inflammation. Judicious inaction is best when the swelling is moderate, and the constant application of a hot-water dressing in severer cases, when the surface is red, and the parts much swollen, and hard and tender to the touch.

INFLAMMATION OF THE EYES.

This is a most important condition, and, from the outset, requires the attention of the physician and the greatest care on the part of the nurse.

The inflammation usually comes on about three days after birth, in the following manner:—on waking from sleep, the child's eyelids are slightly glued together; their edges, particularly at the corners, are redder than is natural, and on turning down the lower lid a little white matter will be observed on the inside. Light causes pain and there is a tendency to keep the eyelids closed. After a short time the lids swell, become red on their external surfaces, and a large quantity of matter is secreted and constantly pours from the eye. Apart from pure medicinal treatment, the nurse must keep the eye free from discharge by constantly washing away the matter secreted. Burn the rags or cotton used in this process at once, and it is most important for the attendant not to carry any of the discharge to her own eyes.

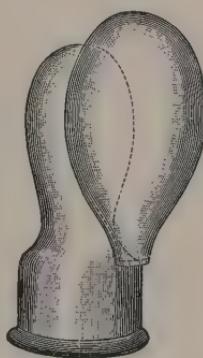
HARE-LIP AND CLEFT-PALATE.

These are deformities requiring the attention of the surgeon, and under ordinary circumstances his aid should, in case of simple hare-lip, be sought within the first six months

of the child's life, so that the operation may be well over before dentition begins. The fourth month is the period of election, but should there be difficulty in sucking and any evidences of inanition, the operation may be performed at an earlier age. The operation for cleft-palate should not be undertaken before the end of the second year.

So far as the mother is concerned, the question of importance is whether or not there is any interference with the act of sucking. If hare-lip be trifling, the infant will be able to suck, provided the mother's nipple be large and the milk flow freely; when the reverse is the case, resort to a nipple shield. In grave cases, especially when hare-lip is associated with cleft-palate, the child is unable to suck either from the breast or from the bottle, and must be fed from a spoon. Occasionally one can succeed in feeding a child so affected from a bottle, by resorting to a false palate. This consists of a bit of thin india-rubber, cut the size and shape of the roof of the mouth and fastened by several firm stitches to an ordinary bottle tip (see Fig. 19). In using this instrument, the nurse must insert it into the mouth in such a way, that the rubber diaphragm will come uppermost and bridge over the imperfect portion of the palate.

FIG. 19.



TIP WITH FALSE PALATE.

TONGUE-TIE.

In this condition the bridle beneath the tongue is either too short, or is attached so near the tip of the tongue as to interfere, at first, with the movements of the organ in sucking, and, afterward, in speaking. Although frequently sus-

pected, it, in reality, occurs very rarely. The best way to determine if tongue-tie exist or not, is to watch whether the infant can protrude the tip of the tongue beyond the lips. If so, it will be able to suck a good nipple readily, and nothing need, nor ought, to be done. Should the reverse condition prevail, it will be necessary to nick the bridle, and, as there is considerable danger of hemorrhage in this operation, a surgeon must always be consulted.

ACCIDENTS AND DISORDERS OCCURRING IN INFANCY AND CHILDHOOD.

BRUISES.

A contusion or bruise must be treated as soon as received, if one would relieve pain, lessen swelling and prevent the formation of a black and blue spot. Compresses wet with hot water, a light ice bag,* or a lotion of fluid extract of witch hazel, are the best remedies. A bruise upon the head in the case of a young infant, and especially when followed by paleness and vomiting, is not to be carelessly overlooked, since it is sometimes the origin of convulsions.

SPRAINS.

Do not make light of a severe sprain, for the consequences are often more lasting than those of a broken bone.

Much care and patience will be required in the management of sprains, the great point being to secure rest for the injured part. Should the knee or ankle joint be involved, put the patient to bed and swathe the part in a hot water

* Heat and cold act in the same way upon the blood vessels, contracting them and preventing the transudation of blood. It is the changes occurring in the latter after leaving the vessels that produce the discoloration.

dressing, or in compresses soaked with arnica or fluid extract of witch-hazel. When a joint of the upper extremity is involved, it is, of course, unnecessary to confine the child to bed; but at the same time the limb must be placed in such a position as to be as quiet as possible, while the local applications already mentioned should be employed. Later passive motion must be practiced in order to prevent permanent stiffness. A sprain, however, needs the surgeon's attention as much as a broken bone.

FRACTURES.

The breaking of a bone is indicated by deformity of the limb, such as bending, shortening or twisting, and when this occurs, much suffering to the patient and injury to the part may be saved by a little careful management. In lifting the child from the spot where the accident happens and carrying him to a bed, it should be one person's duty to support tenderly the injured limb, instead of allowing it to dangle loosely. Once in bed, lay this upon a soft, rather broad pillow, double around the limb, and tie up tightly so as to afford protection from jars or shaking.

Beyond this, nothing should be done until the physician arrives, except preparation of the bed in case of fracture of the lower extremity. This preparation consists in arranging a firm, though not too hard, mattress, with two or three under blankets for the sake of warmth.

CUTS.

These may be *clean*, as when made by a knife; *torn*, by a broken plate; or *abraded*, by a fall on hard, rough ground. If large and deep, the surgeon should be called at once. In trifling cases, the nurse must first thoroughly cleanse the

wound by sponging it with hot water, and check the flow of blood by pressure, by the application of hot water, or should the hemorrhage be obstinate, by the use of a solution of alum. In the case of a knife cut, the next step is to press the edges together and fix them in this position by applying a number of narrow strips of surgeon's adhesive plaster at short intervals across the wound. A torn wound may be dressed in the same way, but greater care is required to coadapt the edges. For abrasions, the best application is a piece of lint covered with vaseline or other bland ointment. The plaster dressings need not be changed until the strips become loose, but the lint and vaseline may be changed twice a day. When an artery is cut, the flow of blood must be checked by pressure on the vessel above the seat of injury; in the case of a vein, below it. Arterial blood flows in jets and is scarlet; venous blood runs in a continuous stream and is purple in color.

BURNS AND SCALDS.

The danger from burns or scalds is in direct proportion to the extent of surface involved and the depth of tissue destroyed. Fortunately, the majority of cases are trifling, and usually the hands or face are the parts that suffer. In these instances there are two things to be done; first, to relieve pain, and secondly, to encourage healing. To accomplish the former, a saturated solution of baking soda; for the latter use some mild ointment—fresh lard, for example—and keep the injured part protected from the air by a dressing of cotton batting.

Should the child's clothing take fire, remember that an upright position not only favors the spread of the flames, but encourages their approach to the neck and head. Any movement of the body, too, aids the flames by bringing

fresh currents of air in contact with the burning materials. Therefore, do not let the child run about, but seize him, throw him down upon the floor and envelop his body closely in the hearth rug or a woolen table cloth.

Should the child have fallen into a tub of scalding water, remove him immediately and undress him. In taking off the clothing, be careful to do it so gently as not to break the blisters produced by the moist heat, and should the under-clothing stick anywhere to the surface, the garments must be cut away piecemeal, leaving the adherent portions untouched.

After the above preliminaries he must, in either case, be put at once to bed. Next prepare a number of pieces of old muslin corresponding in size with the injured areas, smear these with fresh lard or cosmoline, apply them and cover all with a thick layer of cotton batting. Should the patient complain of cold hands or feet, or of faintness, a little whisky or brandy may be administered and artificial heat applied to the extremities if these be uninjured. Nothing else should be done without the physician.

STINGS OF INSECTS.

Children, being more ignorant, are more frequently stung by bees, wasps, and other insects, than adults. Examine the wound the first thing with a magnifying glass, and if the sting be still in the tissues, extract it with a pair of tweezers, or squeeze it out by firm pressure in the neighborhood of the puncture. After this apply aromatic spirits of ammonia or eau de Cologne. These will relieve the pain and itching. When the sting produces great pain and inflammation, apply a flaxseed poultice for twenty-four hours. The frequent use, afterward, of camphorated soap liniment will be productive of good results.

FOREIGN BODIES IN THE EAR.

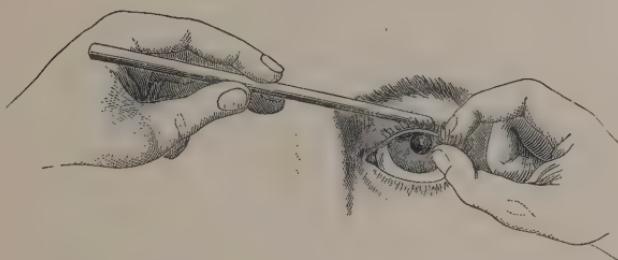
When a foreign substance has entered the ear, the plan for its extraction depends somewhat on the nature of the material. In any case, however, bend the child's head toward the affected side, cause him to open his mouth as wide as possible, and at the same time gently pull the external ear upward and backward. In this way the external canal of the ear is straightened and stretched to its widest extent, and a small body like a bead may drop out. Another method is to wash the foreign body away with warm water and a syringe. Should the substance be of a nature to increase in size by absorbing moisture, such as a pea or bean, its extraction must be left for the physician, though it is to be delayed no longer than absolutely necessary. When an insect enters the ear, the external canal must at once be filled with fresh olive oil.

FOREIGN BODIES IN THE EYE.

A simple plan for removing cinders and the like from the eye is to pull the upper eyelid forward and downward, by grasping the eyelashes, and direct the child to look upward. In this way the lashes of the lower lid are made to sweep over the inside of the upper one, and thus may brush away the foreign body. If this be unsuccessful, and if the offending substance be in sight, remove it with the corner of a fine handkerchief; but, if not seen on the eyeball, it must be looked for beneath the lids. It is easy enough to pull down the lower lid and examine its internal surface; in case of the upper lid, however, it is necessary to perform eversion; this is done by drawing the lid downward and forward, and turning it over a thin lead pencil. (Fig. 20.) Direct the child, in the meanwhile, to look down. When the intruding body is disclosed by this process, it may be

brushed away by a little cotton twisted upon the end of a match stick ; the touch must be very gentle, and no prolonged effort made if the mote be imbedded. Treat any

FIG. 20.



METHOD OF EVERTING UPPER EYELID.

slight irritation following this accident and the process of removal by frequent applications of hot water.

FOREIGN BODIES IN THE NOSE.

Children frequently insert shoe buttons, peas, beans, and other small objects into the nose. When these are not too firmly fixed, or have not been pushed too far up, they may be removed by closing the opposite nostril and causing the child to blow his nose forcibly. Another way is to stretch the orifice of the nostril, and, having made a blunt hook by bending the upper part of a hair-pin sidewise, pass this up and over the object and gently extract it. Should any difficulty be experienced, it is better to consult a physician than use persistent force.

FOREIGN BODIES IN THE THROAT.

A large, unchewed mass of food, a fish bone, or some metallic substance, as a piece of money, may become lodged at some point in the throat.

When this occurs, immediately insert the finger and thumb into the mouth, pass them as far down the gullet as possible, and if any object be felt make an attempt to pull it forth.

Instead of lodging in the upper part of the gullet, the foreign body may be arrested midway in its course to the stomach. Let the child then partially masticate and swallow a piece of bread and several mouthfuls of water, which will probably assist the object's passage into the stomach ; if not, medical skill will be required.

Foreign bodies, such as buttons and coins, that pass directly into the stomach give rise to little trouble, and soon find their way through the alimentary canal, and are voided from the rectum with the ordinary faecal evacuations. Laxative medicines are never needed unless the bowels be absolutely confined, and then moderate doses of castor oil are the most suitable.

BLEEDING FROM THE NOSE.

Hemorrhage from the nose is sometimes so excessive as to lead to debility, or even threaten serious results. An injury or abrasion of the lining mucous membrane is the usual cause of hemorrhage, though it may result from certain constitutional conditions. To arrest the bleeding, put the child upon a bed, with the head and shoulders well elevated. First make pressure, with the thumb and index finger, on the root of the nose, *i. e.*, that portion between the eyes, or on either side of the nostrils where the blood vessels, ascending from the lip, are felt to pulsate. Should this fail, after a reasonable time, plug the nostril from which the blood flows with a cone-shaped plegget of absorbent cotton or lint ; this may either be dry or saturated with a solution of alum and water as hot as can be borne. The inhalation of the

vapor of spirits of turpentine, or the immersion of the feet and legs in a hot mustard foot bath, are each successful in some cases. If the bleeding be obstinate, apply a piece of ice wrapped in flannel to the forehead or the back of the neck.

EAR-ACHE.

Ear-ache is a very common cause of crying in infancy and childhood. Screaming from ear-ache may be distinguished from that due to pain in the bowels, another fruitful source of crying, by the former being more continuous, and by the child frequently carrying his hand to his head; again, in ear-ache the passages from the bowels are natural, while in bowel-ache they are usually altered in character and offensive.

Put into the ear, for a short distance, a small piece of absorbent cotton saturated with a small quantity of olive oil containing a few drops of laudanum, or, better still, with a two per cent. solution of cocaine; at the same time dry or moist heat may be applied to the external ear.

VOMITING.

The most healthy infants, even though they be fed at a normal breast, often expel a portion of each feeding. This is an act of regurgitation rather than vomiting, and is, in reality, a natural method of relieving an over-burdened stomach.

Vomiting proper is preceded by the sensation of nausea; is followed by lassitude, and is often attended by fever. It indicates some disorder of the stomach. For its relief, perfect rest for the whole body; several hours' starvation, or rest for the stomach, and a reduction in the quantity and strength of the food, are necessary. Bits of ice, soda-mint, lime

water, and a mixture of equal quantities of cinnamon water and lime water, in teaspoonful doses, are simple and efficient remedies; a weak mustard plaster placed upon the pit of the stomach is always useful. Should the symptom be obstinate, however, the case becomes too serious for the mother to manage on her own responsibility.

COLIC.

Colic is a very common affection of infancy. It usually occurs in the period between birth and the end of the third month, and gives rise to much discomfort, both to the infant and its attendants, by causing fretfulness, crying and wakefulness. The treatment is very much one of diet and properly prescribed drugs. Still, there are some domestic remedies which may be used safely and with success. Thus, the body should be anointed twice a day with warm olive oil and enveloped in a broad flannel binder. It is even more important to keep the feet warm, and for this purpose thick socks or long woolen stockings should be worn, and, in bad cases, artificial heat must be applied by hot water bottles. Medicines are indicated chiefly during attacks of pain. A serviceable prescription is ten drops of gin in a teaspoonful of sweetened warm water, or a small teaspoonful of hot soda mint. It is also well to administer a teaspoonful of caraway water after each nursing, or with each bottle of food.

When a paroxysm of pain is violent enough to lead to depression of the fontanelle and threaten collapse, place the infant in a warm bath for five minutes; after removing and carefully drying him, wrap him in a blanket; put a flax-seed poultice with a dash of mustard over the abdomen; apply a hot water bottle to the feet; relieve the bowels by an enema of warm water, and by the mouth give him ten

drops of gin or brandy in warm water. If the fontanelle still remain depressed, continue the stimulant in doses and at intervals proportioned to the urgency of the symptoms.

CONSTIPATION.

Habitual constipation is such a common occurrence in infancy and childhood that it warrants a somewhat detailed consideration. The methods that may be safely employed to clear the lower bowel of accumulated faeces, or, in other words, to relieve the actual state of constipation, will be first noticed, for this is always a necessary step when there is painful straining, and in case there has been no movement for a day or more. For this purpose injections are most efficient, and when given with care, are entirely free from danger.

A serviceable plan is to inject into the rectum, according to the age of the patient, from one to four teaspoonfuls of warm olive oil; allow it to remain for six hours, and then use one or more injections of castile soap and warm water, olive oil, soap and warm water, or table salt and warm water. The preliminary injection of oil softens the faeces, while the subsequent ones have the additional effect of distending the walls of the rectum, thus bringing about muscular contraction and expulsion of its contents. Should a compact faecal mass be present at the anus and be too bulky to escape—a condition often visible during straining—more liquid must be injected, and if this fail the mass must be broken up by the finger and its passage assisted by gentle pressure upon the parts behind the anus while expulsive efforts are being made. The process of breaking up is easy, as the anus is widely distended at such times. In obstinate cases little result may follow a single administration of the injections, though a course of one or two oil

injections and purgative enemata for several successive days rarely fails to empty the bowel.

The best syringe for children is one of hard rubber with a long, smooth nozzle, having a capacity of six fluidounces. When oil is injected, the intention being to have it remain in the rectum and act mechanically on the fæces, its retention is best secured by firmly pressing a warmed pad of flannel against the anus for five minutes after the insertion, the patient, in the meanwhile, lying upon his back. The laxative enemata must vary in bulk with the age of the child, or, in other words, with the capacity of the rectum; one fluidounce (two tablespoonfuls) will be sufficient for an infant of six weeks, while from four to six fluidounces are required at the age of two years. The quantity of oil, salt, or soap to be used must depend upon the quantity of water —two teaspoonfuls of oil or one teaspoonful of salt to eight tablespoonfuls of water being a good proportion, and if soap be employed, it is sufficient to stir a bit in the water until suds begin to form. After drawing the fluid, which must be tepid, into the syringe, grease the nozzle well and gently insert it into the anus, directing the point a little toward the patient's left; next, slowly force down the piston until all the liquid is expelled or complaints of pain indicate that the bowel is sufficiently distended. If it be possible to force retention for a moment or two by pressure on the anus, the movement will be freer and easier than if the fluid be allowed to flow away at once. The best positions for the child are either on his back with his legs well drawn up, or resting on his abdomen across the nurse's lap.

For the prevention of further constipation the diet must be regulated according to the rules given in Chapter VIII, and besides regulating the food and hours for meals, bath-

ing, sleep, exercise and clothing, care must be taken to establish fixed habits of defecation.

In my experience the youngest infant can be taught to use a chamber. And if this vessel be presented each day at the same hour he soon falls into regular ways. Should faulty habits be established, or constipation exist, to establish regularity resort to such measures as injections, and abdominal massage at the same hour each day.

After the third year the best period of the day for the bowels to be moved is immediately after breakfast, and no call of duty or pleasure should be allowed to interfere. When constipation is to be overcome natural efforts must be made then. These efforts may at first be ineffectual, but much can be accomplished by perseverance in a daily, sustained effort, for about ten minutes. When this plan fails, use injections or other methods of relief, taking care to keep to a certain hour, that the formation of a habit may be encouraged.

Thorough rubbing of the abdomen is often successful in inducing a movement of the bowels. This should be done with the palm of a well-warmed hand, gentle pressure being made, and the movements directed first from the brim of the pelvis on the right side upward to the rib margin, then across from the right to the left, and finally downward on the left side from the margins of the ribs to the brim of the pelvis again. Such manipulation excites peristaltic action, and encourages the passage of the intestinal contents along the large bowel toward the anus. Ten minutes is quite long enough to continue the rubbing. The manipulation may be rendered more effective by using warm sweet oil, or a weak ammonia or turpentine liniment as an inunction.

With children of six years and upward daily cold spong-

ings of the body, followed by frictions with a coarse towel until the surface is red, are very beneficial.

Manna, phosphate of sodium, and soap suppositories are among the medicines that may be safely used in the nursery.

Manna, as it imparts a sweet taste only, may be dissolved in the food, and given from the bottle as often as required; a piece as big as a pea, once, twice or three times daily, will be sufficient for an infant of six months.

Phosphate of sodium—an admirable laxative—can also be administered with the food; five or ten grains, three times daily is the proper dose at the same age.

Soap suppositories must vary in strength with the age. At two months one grain of soap to ten grains of cocoa-

FIG. 21.



SOAP STICK.

butter is the proper proportion; at one year the quantity of soap may be increased to five grains in each suppository, and so on. A substitute for soap suppositories may be prepared in the nursery, as follows: Cut from a bar of good castile soap a piece two inches long and half an inch thick. Scrape this into a cone, pointing one end like a sharpened pencil, but with a blunter point and more gradual slope; make it quite smooth by rubbing the surface with a wet rag (see Fig. 21). When the soap stick is used anoint the pointed end with vaseline and gently insert it into the rectum and keep it there until the action begins. It is not desirable to leave any fragments of soap in the rectum.

CONVULSIONS.

Convulsions arise from so many diverse causes, that it is impossible to indicate more than what is to be done during the fit and prior to the arrival of the physician.

When the attack comes on, the child must be undressed at once and plunged into a warm bath, containing enough mustard flour to stimulate the skin thoroughly, for five minutes. This usually restores consciousness and checks the muscular twitching. Should there be a distinct history of overloading of the stomach, give an emetic of ipecacuanha, and after this has operated, a purgative dose of castor oil. One or more doses of bromide of potassium, five to ten grains, according to the age, may be also safely given; this salt must always be administered in solution.

A CHILL.

This is always a serious occurrence and warrants sending for the doctor. Before his arrival, put the child to bed, surround him with bottles containing hot water, place a moderately strong mustard plaster over the abdomen or over the region of the heart, and administer whiskey and hot water in small doses and at short intervals.

The ailments of children do not so frequently begin with a chill, as do those of adults, but when it does occur, it is a more decided indication of the future gravity of the attack.

FEVER.

It is not my intention here to refer to the management of the essential fevers, for I hold that neither mother nor nurse is capable of managing them without professional assistance.

The following table, however, of the features of the eruptive fevers will answer some of the questions which so

frequently suggest themselves to the minds of anxious mothers :—

ERUPTIVE FEVERS.

Name.	Period of Incubation.	Day of Rash.	Character of Rash.	Rash Fades.	Duration of Illness.	Duration of Contagiousness.
Measles.	10 to 14 days.	4th day of fever, or after 72 hours' illness.	Small, dull, red pimples, appearing behind the ears and on face.	On 7th day of fever.	9 days.	From second day, for exactly 3 weeks.
Scarlet Fever.	2 to 7 days.	2d day of fever, or after 24 hours' illness.	General rosy blush appears first about neck and shoulders.	On 5th day after fever.	8 or 9 days. (This does not include sequels.)	Fourth day, for 6 or 7 weeks.
Typhoid Fever.	10 to 14 days.	7th to 14th day.	Rose-colored, slightly elevated spots, few in number, chiefly on abdomen.		14 to 21 days.	Not contagious.
Chicken-pox.	8 to 16 days.	2d day of fever, or after 24 hours' illness.	Appears in crops on back and abdomen, small, red papules rapidly passing into globular vesicles.	Slight scabs form about 4th day of fever.	4 or 7 days.	First day, for two weeks.
Small-pox.	14 days.	3d day of fever, or after 48 hours' illness.	Small, hard, red pimples, becoming vesicles, then pustules, appearing first on face and neck.	Scabs form on 9th or 10th day of fever, and fall off about the 14th.	14 to 21 days.	First day, for about one month.

It may be well to give a few directions as to the management of a fever in the absence of a physician. Every fever, whether it be due to a poison circulating in the blood or to a passing irritation of little or no moment, is attended by the following symptoms, namely: heat of skin, lassitude, loss of appetite, and thirst. When these features arise, the

mother must be on her guard and take steps to place her charge in the best possible condition. Give the child, the first thing, a mustard foot bath;* then put him to bed with only sufficient covering to keep up a normal body temperature. Reduce the diet to the simplest possible basis, milk food being the safest. A moderate quantity of pure water, or of some effervescent saline water, and of ice, may be allowed. Febrifuges, as aconite, or even sweet spirits of nitre, had best not be given without advice, and quinine or other remedies are not to be trifled with.

Should head-ache be severe, place cold compresses upon the forehead, or a weak mustard plaster (one part of mustard to six of flour) on the nape of the neck.

Free urination should be encouraged by hot compresses over the bladder, and it usually does no harm to secure a free action of the bowels by a mild saline laxative.

CONTAGIOUS DISEASES AND DISINFECTION.

There are certain points connected with the nursing of contagious diseases and the subject of disinfection that are worthy of mention.

In every case of contagious disease, allow in the room only those who are necessary to nurse the sick. The nurse must avoid over-fatigue, have regular meals of digestible and nourishing food, and fixed hours for sleep and relaxation. The chamber selected for the sick room should be large, well ventilated, and as near the top floor of the house as possible. Upholstered and stuffed furniture, curtains, hangings, carpet and other articles capable of holding disease germs, are difficult to disinfect, and should be removed before the entrance of the patient; in fact, to put this matter

* See page 110.

in a nutshell, the sick room should contain only such furniture as will be absolutely needed by the patient and nurse. Scrupulous cleanliness is essential. Remove dirty dishes, vessels with discharges, soiled napkins, and the like, at once.

Disinfectants are substances that destroy the infective power of infectious materials, and must be confounded with neither antiseptics or arrestives of putrefaction, nor with deodorizers or neutralizers of bad smells.

In the use of disinfectants, it is important to bear in mind that contagious virus must be destroyed at its source. As this, of course, is the *body* of the sick, all discharges must have their power for evil destroyed as soon as possible. Receive discharges from the mouth and nose, especially in cases of scarlet fever and diphtheria, in bits of rags, and burn them immediately after use. When the skin is affected, as in scarlet fever, for example, the flakes that fall away are highly infective. To prevent these becoming disseminated, the surface should be anointed several times a day with vaseline, lard or cocoa-butter, either of which substance will be rendered more efficient by the addition of carbolic acid (one part to forty).

Articles used about the patient, such as sheets, pillow-cases, blankets and clothes, should not be removed from the chamber until they have been soaked for at least an hour in the following disinfecting fluid:—

Sulphate of zinc	8 ounces.
Carbolic acid	1 ounce.
Water	3 gallons.

Place, after this, the soiled articles in boiling water for washing.

Articles not requiring to be frequently changed, such as feather or hair pillows and mattresses, need fumigation. This may be accomplished at the termination of the case.

Keep a small quantity of the above fluid in all vessels used for receiving the discharges of the patient, and, after being used, empty quickly and clean with boiling water. Water closets or privy wells in which these discharges are poured must also be disinfected each day with a solution of copperas (one pound to the gallon).

Fumigate the sick room itself as soon as the patient leaves it. To do this, tightly close the room and stuff all apertures, such as keyholes, loose window sashes, spaces under doors and so on, with cotton or rags. Then place a quantity of roll sulphur,* broken into small fragments, in a saucer, standing either in a large iron kettle or supported by two bricks set in a tub partially filled with water. Next, sprinkle a little alcohol over the sulphur and apply a live coal, and as soon as combustion begins, leave the room, shutting the door of exit. The room must remain closed for at least twelve hours and then be thoroughly aired.

Wood-work and walls, if painted, should be wiped down with a solution of chloride of lime (one ounce to the pint) or carbolic acid (one drachm to the pint), and then scrubbed with soap and hot water. Re-papering and fresh painting are advisable in cases of scarlet fever or smallpox.

The person of the patient or nurse may be disinfected by washing with a two per cent. solution of carbolic acid.

Both milk and water will carry disease germs, and hence both must be thoroughly boiled when there is any danger of their being contaminated. Never give delicacies or articles of food that have stood in the sick room to other members of the household.

* The quantity of sulphur required is three pounds for every thousand cubic feet of space.

VARIOUS DRESSINGS.

POULTICES.

Poultices may be made with Indian meal, bread, starch, ground slippery elm, flax-seed meal, or, in fact, any material that will retain heat and moisture. Flax-seed meal is usually selected because it is bland and non-irritating; because it contains considerable oil, which gives it great heat-retaining properties, and because it is cheap.

All poultices should be large, from half an inch to an inch thick; applied as hot as can be borne, and renewed as soon as cold. A covering of oil silk or thin rubber cloth is useful to prevent rapid cooling.

FLAX-SEED POULTICE.

Take a perfectly clean bowl, pour in the requisite quantity of boiling water, then add the flax-seed meal slowly, stirring continually with a large spoon, to prevent the formation of lumps, until it becomes stiff enough not to run freely, then spread between two layers of old muslin, folding the edges over so as to avoid soiling the part to which it is applied.

THE JACKET POULTICE.

The jacket poultice, so often employed in cases of pneumonia, requires some skill in its preparation.

For a child from one to three years old, use about a pound of flax-seed meal in each poultice.

Take a piece of muslin or a large towel long enough to go all around the patient's chest, and of sufficient width, when folded on itself, to extend from the collar bone to a few inches below the lower end of the breast bone. After the meal is properly mixed, spread it evenly over one entire half, lengthwise, of the cloth, which should then be folded

over. Place this around the chest, with the open edge upward, and fasten behind to prevent it from slipping down. It should be held up by a tape passing over each shoulder.

Put this poultice on as hot as the nurse can tolerate it against her cheek; cover with oil silk and renew every five or six hours. When the cool poultice is to be removed, have a fresh one ready for immediate application.

BREAD POULTICE.

Make a bread poultice by soaking a muslin bag filled with bread crumbs, for a few moments, in boiling water, then squeeze it gently between two towels until it does not drip.

CHARCOAL POULTICE.

The charcoal poultice is useful in foul and sloughing sores, and is prepared by incorporating some powdered charcoal with a flaxseed, an Indian meal or a bread poultice, and then sprinkling the surface with more charcoal.

PLASTERS.

MUSTARD PLASTER.

These plasters are used for the purpose of making counter-irritation, and must be graduated in strength according to the tenderness of the skin and the end to be accomplished; pure mustard is very irritating and will quickly blister the tender skin of a child. Flour is the ordinary diluent, and the strength of the plaster ordinarily ranges from one part of mustard to three, six, or even more parts of flour.

In making the plaster, take one teaspoonful of mustard flour and add to it three teaspoonfuls of wheat flour; mix them together thoroughly on a plate, and pour on as much

hot water (never vinegar) as may be necessary to make a soft mass. Spread evenly over a piece of muslin. To prevent the mustard from adhering to the skin, place a piece of gauze or thin muslin over the surface of the plaster; turn down the edges as in poultices.

Remove the plaster after the surface becomes quite red.

SPICE PLASTER.

Take equal parts of ground ginger, cloves, cinnamon, and allspice, and one-fourth part of cayenne pepper; mix the ingredients together on a plate, and put the whole into a flannel bag about as large as the hand, and wet with hot whiskey or alcohol.

After the bag is filled it is better to quilt it, otherwise, as it is usually worn some length of time, the ingredients are apt to fall together in a lump.

DRY, HEATED APPLICATIONS.

Make a bag of thick flannel, somewhat larger than the part to be covered. Half fill it with hot bran, hops, chamomile flowers, or whatever is to be used. Apply to the part on which it is intended to act. Retain it there by a bandage. When the bag and contents become cooled, quickly remove, substituting a few thicknesses of hot flannel until the bag can again be heated by placing it on a tin plate in the oven, or by holding it over burning coals, being careful, of course, not to scorch it.

COLD WATER DRESSING.

Take a piece of old linen or muslin large enough to cover the affected part. Thoroughly wet with cold water. Keep constantly wet by re-dipping in the cold water, or by gently squeezing out a wet sponge on the cloth, so as to

keep it wet without dripping. The latter plan is the better, as it causes no disturbance of the parts beneath, an important consideration in many cases.

HOT WATER DRESSING.

The hot water dressing is prepared in the same way as the above, substituting hot for cold water, and covering with oil-silk.

FLANNEL DIPPED IN SPIRITS.

Take a piece of old, soft flannel. Heat it before the fire. Then fold it into the size and shape required. Dip into hot water and wring it dry. While this is being done by one person, some one else should put some common whiskey into a shallow dish over the fire, and heat it, being careful that the whiskey does not catch on fire. As soon as thoroughly heated, dip the flannel into it and squeeze out any excess of spirits, which would merely drip away, to the annoyance of the patient. Have the surface exposed, and rapidly apply the flannels as hot as can be borne. Over this flannel place another piece which is dry and has been heated quite hot and folded like the first one. If desirable, a bandage may be brought around to secure them in position. As soon as the inner flannel, which was dipped in the whiskey, has become somewhat dry, another one should be prepared at once and applied in its stead.

TURPENTINE STUPE.

A turpentine stupe is made by wringing a piece of old flannel out of hot water and sprinkling a few drops of warm spirits of turpentine on it. It should be covered with oil-silk while applied, and removed when sufficient irritation of the surface is produced.

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